increase in demand for controls and services is also expected to severely strain company in-house technical personnel and resources, and is expected to drive up the cost of outside contract personnel, services and equipment. As a result, the ability to meet the proposed compliance deadline may be compromised.

In addition, CMA is concerned that the construction permit demand created by the broad application of the HON rule could overload the permitting system at the Federal, State, and local levels at a time when states are developing and implementing new Title V operations permit programs, i.e., 1994-1996. Delays in obtaining construction and/or operating permits are likely to occur. Further delays may occur in areas where NOx offsets must be acquired before fume incinerators or flares can be permitted and installed. A readily available one-year compliance extension would ease the compliance gridlock caused by the HON rule.

b. Applications For Extensions Should Be Allowed Up Until The Compliance Date

In some cases, the need for a compliance extension may not be apparent until after the date an Implementation Plan or a Title V permit application is due. For instance, a source may discover several months prior to the compliance date that a newly installed piece of equipment does not meet specifications and the vendor cannot replace it until after the compliance deadline passes. Or, a source may have relied in good faith that a necessary preconstruction permit will be approved on time, but it is held up several months, which delays construction such that the compliance deadline will be missed. In these types of instances, equity requires that requests for extensions be allowed up until the compliance date.

The Act places no restrictions on the timing of an application for a compliance extension. Section 112(i)(3)(B) states that the permitting authority "may issue a permit that grants an existing source up to one additional year to comply with standards under subsection (d) if such additional period is necessary for the installation of controls." (emphasis added). The only restriction placed on the extension is that it must be based on the installation of controls. Therefore, sources that need more time to install controls should be allowed to apply for an extension up until the compliance date.

6. Points Which Change To Group 1 Status Should Be Granted Up To Three Years To Reach Full Compliance

Section 63.100(f)(4) requires a Group 2 emission point that becomes a Group 1 emission point because of a change in the manufacturing process to be in compliance with all the requirements for Group 1 points no later than 150 days after the process change is made. The 150 day period is not realistic or achievable in all situations, e.g., installation of a control device. CMA recommends that §63.100(f)(4) be changed to allow up to three years for an existing Group 2 point to come into compliance with Group 1 control requirements.

Clean Air Act §112(i)(3)(A) specifically allows for up to three years for existing sources to meet MACT requirements. This provision logically applies to existing Group 2 points which become subject to MACT controls due to a process change. The "up to three years" compliance time will be necessary for sources which must design and install new control equipment to meet Group 1 MACT requirements. For these sources, 150 days is an unachievable time period.

The "up to three years" compliance time would provide sources that require a longer period the necessary time to achieve compliance, and would parallel other requirements under part 63. EPA's draft proposal for requirements under §112(g) of the CAA (to be codified as part 63, subpart B) contemplates compliance for modified sources no later than three years after the modification. The HON should require a consistent compliance timeline.

When the facility notifies the Agency of the change from a Group 2 to a Group 1 status, such as the 90-day notice required in §63.118(g), the facility could inform the Agency of the time period (up to three years) it would take to install the controls.

7. <u>The Rule Should State That the HON Is MACT for Section 112(g) Modifications</u>

CMA believes that HON requirements should be presumed to apply to emission points that become Group 1 points whether or not the change that caused the point to become Group 1 is a modification under section 112(g) of the Act. Preexisting MACT standards such as the HON must apply to new and modified sources in order for sources and regulators to know quickly and with certainty what requirements apply. In this sense, CMA agrees with the preamble discussion on p. 62684 that HON requirements will apply to newly constructed, reconstructed, or modified sources as they are defined under section 112(g) of the Act.

CMA is concerned, however, that the regulation is unclear on this point. Section 63.100(f)(4) states that changes that are not section 112(g) changes must comply with HON requirements within 150 days. (As discussed in II.C.6. above, CMA believes that this may be an insufficient period.) Section 63.100(g) directs sources to determine whether the change constitutes "a new, existing, or modified source under section 112(g) of the Act."

Both sections are silent as to what requirements apply if a change triggers MACT under section 112(g). CMA recommends that the final HON rule state clearly that when a change triggers either new or existing MACT requirement under 112(g), HON requirements apply. Such a provision would provide a clear and consistent interface between the HON and section 112(g) requirements.

D. MONITORING, RECORDKEEPING, AND REPORTING

1. The Final Rule Should Include Only Those Monitoring, Recordkeeping, and Reporting Requirements Necessary For Compliance Demonstration and Enforcement

The proposed rule includes extensive requirements for sources to monitor, record, and report information related to implementation of the rule, Monitoring requirements in subpart G fall into three basic categories: monitoring of control device (or other process equipment) parameters, visual inspections, and leak detection and repair. Monthly monitoring of wastewater influent and/or effluent concentrations may also be required. The rule requires sources to keep readily accessible records of information necessary to document compliance with the regulation for five years. For parameters that must be monitored continuously, a record of at least one monitored value for every 15 minutes of operation must be kept. Finally, in addition to initial, one-time reporting requirements, the rule requires sources to submit Periodic Reports on a semi-annual, or sometimes quarterly, basis. The Periodic Reports are required to contain information on periods when monitored parameters are outside established ranges or when inspections detect a problem.

Some level of monitoring, recordkeeping, and reporting is necessary to enable sources to demonstrate compliance and to facilitate enforcement of the rule by regulatory agencies. We recommend, however, that <u>only</u> those monitoring, recordkeeping, and reporting requirements that are <u>necessary</u> for compliance demonstration and enforcement be included in the final rule. As discussed below, we believe it is in the best interest of all -- including the regulated community, regulatory agencies, and the public -- to require only that which is needed to provide reasonable assurance of compliance.

a. Monitoring, Recordkeeping, and Reporting Requirements Represent a Costly Burden To The Regulated Community

CMA member companies estimate that the monitoring, recordkeeping, and reporting requirements in the proposed HON alone will require an additional 0.5 to 1.5 person-years of effort for each process unit affected by the rule. Sources with multiple process units will require several additional staff to manage all of the monitoring, recordkeeping, and reporting paperwork associated with the rule. Greater manpower needs are projected for older facilities without process computer controls. Significant manpower needs are also estimated to perform periodic monitoring and recordkeeping requirements such as car-seal inspections, hatch inspections, and tank inspection. Table 4 summarizes estimates by several CMA member company facilities of the burden associated with the monitoring, recordkeeping, and reporting requirements in the proposed rule.

It is important to note that CMA member companies indicate that these additional manpower needs will be required regardless of whether a source has to install any new control equipment to comply with the HON. In all cases, the additional burden of the monitoring, recordkeeping, and reporting requirements of the rule will be imposed without <u>any</u> direct environmental benefit.

It is important to note that CMA member companies indicate that these additional manpower needs will be required regardless of whether a source has to install any new control

TABLE 4 - ESTIMATED MONITORING, RECORDKEEPING, AND REPORTING BURDEN OF PROPOSED HON

Facility	Estimated Burden (Annual)
A	Per Process Unit 0.5 - 1 person-year (clerical) 0.25 - 0.5 person-year (technical)
B	Per Process Unit 0.5 person-year
C	Per Facility 1 - 2 person-years
D	Per Facility 2.5 person-years
E	Per Process Unit 1 person-year (clerical) 0.5 person-year (technical)

equipment to comply with the HON. In all cases, the additional burden of the monitoring, recordkeeping, and reporting requirements of the rule will be imposed without <u>any</u> direct environmental benefit.

In addition to the costs imposed by the extensive monitoring, recordkeeping, and reporting requirements of the rule, CMA is concerned that these requirements will expose facilities to excessive fines and penalties for insignificant recordkeeping and reporting errors and/or inadvertent omissions. Because of the magnitude and complexity of the monitoring, recordkeeping, and reporting requirements in the HON, there is a high probability that all sources will experience some recordkeeping problems, even though no significant emissions increases occur. EPA should avoid setting monitoring, recordkeeping, and reporting requirements that will divert compliance and enforcement efforts away from control requirements that have a positive impact on the environment toward recordkeeping and reporting requirements that will have no impact on the environment.

b. Monitoring, Recordkeeping, and Reporting Requirements Increase Burden on Regulatory Agencies to Process Information And Conduct On-Site Inspections

The amount of information that sources are required to monitor, record, and report under the HON also imposes a direct burden on regulatory agencies. Increasing the frequency and/or amount of information reported will necessitate additional resources within regulatory agencies to handle, process, and store information -- otherwise it should not be required to be reported. Likewise, increasing the amount of information that sources are required to record and retain on-site will increase the amount of time required for inspectors to review records and make compliance determinations during on-site inspections. Reducing the amount of information required to be recorded and reported to only that which is necessary for compliance demonstration and enforcement will ensure that valuable regulatory agency resources are not needlessly tied up pursuing minor paperwork violations, but rather are available to implement other important CAA programs, such as the Title V operating permit program.

c. Excessive Monitoring, Recordkeeping, And Reporting Requirements Do Not Benefit The Public

As stated previously, requirements for monitoring, recordkeeping, and reporting do not produce any direct benefit on the environment. Instead, they provide essential information for sources to demonstrate compliance with control requirements and for regulatory agencies to make enforcement decisions. In addition, they provide information to the public to review actions by both regulated sources and regulatory agencies. Thus, the public can also benefit from streamlining monitoring, recordkeeping, and reporting requirements by reducing the amount of extraneous information available for review.

2. The Final Rule Should Allow Data Compression Techniques To Be Used For Monitoring And Recording Operating Parameters

The proposed rule requires sources to keep continuous records of certain control device (or other process equipment, such as recovery devices) operating parameters. Section 63.111 defines a "continuous record" as:

> "documentation, either in hard copy or computer readable form, of data values measured and recorded at least once every 15 minutes. If data values are measured more frequently than once every 15 minutes, the continuous record means either: a record of each 15 minute block average calculated from all measured data values during each 15-minute period; or a record of all measured values."

Thus, for each operating parameter which is subject to continuous monitoring requirements, a minimum of four records per hour must be recorded and retained. Section 63.103(c) further requires sources to retain for five years in a readily-accessible place all records required by the rule. For a single operating parameter being monitored on a control device, this requirement means that a total of at least 175,200 data values must be recorded and retained over a five year period. (Four data values/hr x 24 hr/day x 365 day/yr x 5 yr = 175,200 data values). Taking into account that multiple emission points and control devices will be present in a major chemical manufacturing plant, the total number of data elements required to be recorded, retained, and readily accessible at a source will be staggering.

Computerized monitoring and recordkeeping systems will help facilities collect and maintain the required information. Many chemical manufacturing facilities subject to this rule already operate computerized process controls for monitoring operating parameters, including some control device operating parameters that are required to be monitored by the rule. However, many of these computer-controlled monitoring systems in place today operate differently than the continuous recorder system envisioned by EPA in the proposed rule. Moreover, many of these existing monitoring systems may not be interpreted by EPA as satisfying the proposed requirements in spite of the fact that they provide sufficient information to provide accurate and reliable data necessary for critical process control functions within a chemical manufacturing operation. As discussed in more detail below, these existing systems rely on "data compression" techniques that reduce the amount of information stored, while retaining essential information on the proper operation of the control device. As presented in more detail in Appendix D, these techniques have been used successfully by the chemical industry for over a decade, without sacrificing data quality or reliability.

In the preamble at p. 62657, EPA requests comments and information relative to monitoring systems that use data compression. Following is CMA's response to those questions.

Data verification - Recorded data are displayed on video terminals in the control room as in all types of computer monitoring/control systems. Periodic checks are made between field and control room personnel to verify the data similar to all computer systems.

Calibration frequency - Frequency of calibration for data compression systems is the same for other monitoring systems. The only difference is how the computer stores the data.

Type of processes currently monitored - At least one large CMA member company reports that virtually all of its chemical manufacturing processes that use computerized control and monitoring use data compression. For this one company alone, this amounts to over 50 different facilities and hundreds of process units. Data compression is not used at facilities without computerized control and monitoring.

Criteria used to select values - Most systems use the normal accuracy of the instruments in the field to prevent "noise" recordings. Typically, a 1 percent variance is used. The key is for the engineer to use his or her knowledge of the process to establish data compression tolerances. The engineer also has to review the data in the historian to assure the "right amount" of data is being stored.

Compliance inspections - Data listings and displays can be generated for compliance inspectors for any given time period. In addition, software programs can be written to audit the storage software. The CAAA provide serious deterrents in the form of criminal penalties to discourage manipulation of computer records.

Two-Year Vs. Five-Year On-Site Storage - A requirement to keep records on site for two years and in central storage for five years should be adequate. In the experience of CMA member companies, inspectors seldom request to review data that is more that 18 months old.

Use of existing computer controlled monitoring systems - CMA member companies operated many processes that are monitored by computer as well as many that are controlled by Distributed Control Systems (DCS). Data from these systems can be used to monitor the process and pollution control equipment, i.e., monitoring the combustion temperature of an incinerator to ensure adequate destruction of emissions.

Below are several specific examples of data compression systems that should be allowed in the final rule. CMA urges EPA to revise the monitoring, recordkeeping, and reporting requirements in the final rule to allow the use of data compression techniques for monitoring and recordkeeping. Not only will this enable facilities subject to the rule to maximize the use of existing monitoring systems, it will provide a more cost-effective alternative for facilities installing new monitoring systems. It will also make useful information more accessible and easier to observe.

a. Systems That Only Store Data Outside Predetermined Ranges Should Be Allowed

In one type of system that utilizes "data compression," the monitoring system is programmed to store data that is outside a predetermined range of acceptable values. When used for process control purposes, these systems may be set to record and monitor values outside the parameter ranges established by the facility to represent proper operation of the process. Such a system enables operators to detect operating problems quickly and provides an accessible record of historical data to assess past problems and predict future problems. By storing only data outside predetermined ranges instead of all data points, data storage capacity is increased, thereby reducing costs. Process control engineers that rely on these systems for critical process control functions find these systems to be accurate and reliable, even though a record of all monitored values is not retained (See Appendix D).

For purposes of monitoring and recording control device operating parameters under the HON, systems that record and store data outside a predetermined range of acceptable values is particularly applicable. Such a system could be used to record those periods when a monitored parameter is outside the site-specific parameter ranges established by a source to represent proper operation of the control device. The advantages of this system are several-fold. First, it ensures that information would be available to operators in a timely way to correct problems. Second, it automatically generates records necessary to demonstrate compliance, thus reducing the likelihood of recordkeeping errors and paperwork violations. Third, it dramatically reduces the data storage requirements for a computerized monitoring system, reducing compliance costs. Finally, it reduces the amount of information that must be retained on-site by a source, reducing the burden to the facility for handling and storing the information and reducing the burden on regulatory agency inspectors to review the information.

CMA recommends that the final rule allow facilities to meet continuous monitoring requirements of the HON using monitoring systems that record only values outside a predetermined range of acceptable values.

b. Systems That Take Continuous Measurements And Calculate 3-Hour And 24-Hour Averages Should Be Allowed

In a second type of system that utilizes data compression, the monitoring system is set to take frequent measurements which are then used to calculate average parameter values over one time period. Subsequently, the individual data measurements are erased to free up memory space. Where these systems are used, they typically obtain information much more frequently than every 15 minutes, but are not designed to store data for five years. Instead, the monitoring data is used to calculate average parameter values, e.g., one-hour, three-hour or 24-hour averages. Only the average values are retained. As with the previously described data compression technique, this type of system is currently used in a variety of process control situations, including operation of control devices, where accuracy and reliability are essential.

CMA is unaware of any reason why this type of monitoring and recordkeeping system should not be suitable to meet the monitoring, recordkeeping, and reporting needs of the HON. In fact, EPA has already recognized the use of this type of data compression techniques in the rule by allowing sources to average data measurements over 15-minute blocks and to retain only the calculated averages. For purposes of the HON, it would be possible to set these systems to generate the parameter averages required, including one-hour, three-hour and 24-hour averages, which then can be retained for five years, as specified. This would produce information needed to detect and report periods when operating parameters are outside the site-specific ranges established by a source. It would also provide a readily accessible record for inspectors. The system further could be set to ensure that individual data points are retained for several days so that the averaging procedure can be verified.

Another factor that EPA should consider is that for many of these systems, the required 15 minute averages would be very difficult to accommodate since the systems work on six minute multiples.

CMA recommends that the final rule allow facilities to meet monitoring and recordkeeping requirements of the HON using systems that take continuous measurements and calculate average parameter values for periods greater than 15 minutes.

3. <u>The Final Rule Should Allow Alternative Approaches To Monitoring Operating Parameters</u>

Where control devices are used to comply with standards for process vents, storage tanks, and wastewater, the proposed rule specifies operating parameters that must be continuously monitored to ensure proper operation and maintenance of the control device. The proposed rule properly allows sources to request approval to monitor alternative operating parameters other than those specified by the rule. In addition, CMA recommends that EPA include the following additional alternatives to monitoring operating parameters in the final rule.

a. Interlock Devices That Prevent Operation Outside Established Limits Should Be Allowed

The proposed rule requires continuous monitoring of control device operating parameters to demonstrate operation of the control device within established performance limits. An equally effective alternative used in some existing facilities is installation of an interlock device system which prevents operation outside established limits. For example, a scrubber used to control emissions from a transfer rack may be equipped with a flow device to monitor the scrubber's efficiency. An interlock device on the flow meter can be set to automatically shut down the loading pump if the minimum acceptable flow is not maintained. Such a system, where applicable, provides a direct mechanism to ensure proper operation of the control device system and should be explicitly allowed in the final rule. Where it is technically feasible and appropriate and interlock devices are installed, CMA recommends that monitoring, recordkeeping, and reporting requirements be deleted, because the facility cannot operate outside the established range.

b. Periodic Data Readings Instead Of 15-Minute Readings Should Be Allowed For Non-Automated Facilities

The proposed rule specifies that for those control devices that must be monitored continuously, records which include at least one monitored value for every 15 minutes of operation are considered sufficient. As a practical matter, this requirement assumes that monitoring systems are part of an automated system that measures and stores data on a continuous basis. Not all existing facilities currently have automated systems for monitoring operations. For facilities without automated systems and where the process equipment reliability has been demonstrated, the rule should allow periodic data readings in place of 15 minute readings, In such cases, the provision for 15-minute readings will have the absurd result of requiring an operator to manually record the same value four times every hour for years without any environmental benefit. Since it is common for many such facilities to have established procedures requiring operators to patrol and monitor operations on eight hour intervals, a requirement to monitor operating parameters periodically, for example, every four hours, would represent an enhanced monitoring program.

CMA recommends that the final rule allow sources that do not have automated systems to monitor operating parameters periodically instead of once every 15 minutes. This can be accomplished by adding a new provision, section 63.114(c) as follows:

> "(c) Periodic operator inspection and records of parameters monitoring are allowed where the source receives approval by the Administrator that the equipment process is sufficiently reliable that continuous, i.e., 15 minute, data points are not required to provide timely verification of proper performance of control equipment."

Similar provisions should be added to section 63.120(e) and 63.127(d).

c. Monitoring of Exceedances Using Strip Charts And Pie Charts Should Be Allowed For Non-Automated Facilities

Another alternative monitoring approach that should be allowed for non-automated facilities is monitoring of exceedances using strip charts and pie charts. Some non-automated facilities continuously monitor process operations and record values on a strip chart or pie chart. When reviewing these charts, it will often be more convenient for operators to note and record values on the chart that exceed established parameters instead of finding and recording actual values at a given time interval.

4. <u>The Final Rule Should Avoid And Eliminate, Wherever Possible Unnecessary Monitoring, Recordkeeping, And Reporting Requirements</u>

When developing the final HON regulations, CMA urges EPA to avoid adding any new monitoring, recordkeeping, and reporting requirements. CMA further recommends that EPA eliminate those requirements that are not <u>necessary</u> for compliance demonstration and enforcement.

For example, when a process change affects the total resource effectiveness (TRE) or flow rate of a Group 2 vent, the information required under section 63.118(h) and (i) should be submitted in the source's regular semiannual report. A special report (as currently proposed) should not be required. CMA understands proposed section 63.114 as requiring monitoring of Group 2 vents only where a recovery device is used to maintain Group 2 status and the TRE is between 1.0 and 4.0. CMA supports this limitation, as no useful purpose would be served by monitoring of Group 2 vents once TRE is established absent a process change.

a. Semiannual Reporting Is Adequate For Most Periodic Reports

Section 63.152 specifies requirements for submittal of Periodic Reports. Periodic Reports are required to ensure that the standards continue to be met and that control devices are operated and maintained properly. According to the proposed rule, Periodic Reports would be submitted semiannually. CMA agrees with EPA that semiannual reporting is the appropriate reporting frequency for most Periodic Reports. EPA has correctly reserved more frequent quarterly reporting requirements for those emission points included in emissions averaging and for those emission points where monitoring results show that parameter values are outside the established range. CMA believes this two-tiered reporting frequency provides incentive for good performance by avoiding additional costs associated with more frequent reporting and should be retained in the final rule.

b. EPA Should Eliminate Requirements For Negative Reports

EPA has appropriately limited reporting requirements in the proposed rule to include only those periods when operating parameters are outside established ranges and only those results of other inspections where problems are detected. By providing for this type of "exception" reporting, EPA has significantly reduced the amount of unnecessary, extraneous information that sources are required to report and that regulatory agencies are required to process. CMA recommends that EPA further eliminate the requirement for facilities to submit "negative" reports, i.e., reports covering periods where no exceptions have occurred. Eliminating requirements for "negative" reports will further reduce the burden to the regulated community and to regulatory agencies associated with reporting requirements, e.g., negative declarations for area sources.

c. Monitoring, Recordkeeping, and Reporting Requirements For Group 2 Emission Points Should Be Minimized

Section 63.117 of the proposed rule requires sources that have Group 2 vent streams with a TRE index value greater than 1.0 but less than or equal to 4.0 to perform continuous monitoring of the final recovery device. As for Group 1 process vents that are subject to control requirements, sources with Group 2 vents (TRE between 1.0 and 4.0) would be required to retain records of continuous measurements for five years and to submit Periodic Reports on an all periods where monitored parameters are outside established ranges. EPA justifies these monitoring, recordkeeping, and reporting requirements for Group 2 vents on the grounds that they will ensure that the final recovery device on a Group 2 vent stream continues to be operated as it was during the group determination test when the initial TRE value was calculated.

CMA opposes the imposition of burdensome monitoring, recordkeeping, and reporting requirements for vent streams that EPA has appropriately judged do not warrant additional controls. EPA has not provided adequate justification for requiring Group 2 vents to be subject to the same monitoring, recordkeeping, and reporting requirements as Group 1 vents. The monitoring, recordkeeping, and reporting requirements for Group 2 vents will be costly to implement, but will achieve no corresponding environmental benefit. This is particularly true for cases where material balances, engineering data, or other information indicate low probability of Group 2 vents becoming Group 1 vents. CMA believes that adequate mechanisms already exist under the CAA, including the section 112(g) modifications program, residual risk determination, and review of MACT standards, to require future control of Group 2 vents, if warranted. Accordingly, CMA recommends that EPA impose only minimal monitoring, recordkeeping, and reporting requirements on Group 2 process vents.

d. Detailed Recordkeeping Requirements For Inspecting Car-Seals Should Be Eliminated

The proposed rule for process vents and transfer operations requires sources to install car seals or other closure mechanisms on vent systems that contain bypass lines to prevent vent streams from bypassing the control device. Sources are required to inspect the seal or closure mechanism once every month and to keep a record that such inspections have been performed. If a car-seal has been broken or valve position changes, the source must include a report of the inspection in the next Periodic Report.

CMA recommends as an alternative that EPA allow sources to adopt standard operating procedures requiring frequent inspections of car seals and other closure mechanisms on control device bypass lines. Under such a work-practice standard, facilities would be required to keep records only when broken car-seals are detected.

5. CMA Supports The Two-Tier Reporting Frequencies

CMA supports the concept of a two-tier reporting frequency as proposed under section 63.152(c)(5). Under this approach, sources which recourse a certain number of excursions in a semi-annual reporting period will make quarterly reports for that emission point which is responsible for the excursions. As proposed, the threshold for triggering quarterly reporting is one per cent excursion outside the parameter range or five per cent monitoring downtime. Section 63.152(c)(5)(i)(A). A source should revert to semiannual reporting after one year. CMA believes this approach is reasonable.

E. SUBPART F DEFINITIONS

1. EPA Should Define Polycyclic Organic Matter (POM) More Narrowly For The HON

Historically, EPA's working definition of polycyclic organic matter (POM) has been that complex mixture of compounds formed during organic combustion and pyrolysis processes. In recent statements on POM, the Agency indicated that EPA intends to continue using this working definition. (See Appendix E, 3/3/92 letter from John Seitz, director, EPA Office of Air Quality Planning and Standards (OAQPS), to Larry Thomas, President, The Society of the Plastics Industry) CMA supports EPA's intent to continue to focus on emissions from products of incomplete combustion and pyrolysis.

EPA has the discretion to narrowly interpret POM as listed under §112(b). Following the introduction of CAA legislation in the 100th Congress, EPA reviewed the list of hazardous air pollutants developed by Congress and deleted some HAPs while adding others. In the 101st Congress, Congress took the EPA's list and incorporated it into the CAAA. As POM was not on the original list of 224 substances proposed by the 100th Congress, it presumably must have been added by EPA in its subsequent review of the Congressional list. See S. Rept. 228, 101st Cong., 1st Sess., at 159-60 (1989).

The definition of POM did not change during consideration of the CAAA by the 101st Congress. Thus, there is no legislative history regarding the definition of POM for applying §112. However, because POM was added to the list of hazardous air pollutants by EPA, EPA's own determination of what is to be considered POM for regulatory purposes should be given deference.

In addition, the list of volatile organic compounds is continually revised based on new data, i.e., photochemical reactivity data. If specific, non-combustion or non-pyrolysis chemicals meeting the current definition of POM are discovered to be HAPs in the future, EPA has the authority to list such pollutants individually, rather than include these VOCs in the general POM category.

CMA recommends that POM, for applicability in this MACT standard, be defined as follows: "Substituted and/or unsubstituted polycyclic aromatic hydrocarbons and aromatic heterocyclic compounds formed or emitted during open flame combustion and/or high temperature pyrolysis processes."

2. <u>**EPA Should Modify Definition of Product**</u>

As discussed in II.A.4., CMA is recommending modifications to the definition of product in Section 63.101.

3. <u>**Several Definitions Relating To Wastewater Require Revision**</u>

As discussed in III.E.9., CMA recommends revisions to several definitions relating to wastewater in Section 63.101.

4. <u>**Definition Of Chemical Manufacturing Process Should Be Clarified**</u>

The present definition of "chemical manufacturing process", section 63.101, is not correct. It equates process with equipment. It reads "Chemical manufacturing process means the equipment assembled and connected by pipes or ducts to manufacture as a product one or more chemicals . . . "

For chemists, "process" means a sequence of chemical reactions and operations leading to a product and not the equipment associated with the process. In section 63.101 and in the preamble text, "chemical manufacturing process" should be changed to "chemical manufacturing process equipment."

In addition, applicability determinations could be made clearer by improving the definition of "chemical manufacturing process." The definition provided in section 63.101 may result in an unclear demarcation of where the coverage of the HON begins and ends. The confusion should be resolved by adopting a definition which considers whether equipment is integral to the work process. CMA recommends that the definition of "chemical manufacturing process" be modified by adding a sentence similar to the following: "a chemical manufacturing process which can operate independently if supplied with sufficient fuel or raw materials and sufficient product storage facilities is considered to be a separate process."

III. SPECIFIC COMMENTS ON SUBPART G

A. DEFINITIONS

1. EPA Should Expand Its Definition Of Continuous Record To Allow Data Compression Techniques And Other Alternatives To Specified Monitoring

As discussed in Section II.C.2. of these comments, we recommend that definition of continuous record be expanded to allow the use of data compression techniques by making the following changes:

> Continuous record means documentation, either in hard copy or computer readable form, of data values measured and recorded at least once every 15 minutes. If data values are measured more frequently than once every 15 minutes, the continuous record means either: a record of each 15-minute block coverage average calculated from all measured data values during each 15-minute period; or a record of each measured value as a data point or using equivalent computer storage techniques.

In addition, CMA suggests in Section II.C.3.6. that facilities with non-automated monitoring systems be allowed to collect data values periodically instead of once every 15 minutes.

2. <u>The Definition Of Group 1 Process Vents Should Make Clear That All Criteria Must Be Met</u>

The definition of Group 1 process vents should make clear that <u>all</u> criteria must be met. EPA has proposed a Group 1 process vent definition that allows ready elimination of vents that are undoubtedly Group 2 from further detailed TRE measurements and calculations. The definition of Group 1 vents in section 63.111 appropriately includes the word "and" to indicate that exceedance of <u>all</u> cutoffs and applicability criteria is required for a vent to be classified Group 1.

3. <u>The Definition Of Group 2 Process Vents Should Make Clear That Any Of The Criteria Must Be Met</u>

The definition of Group 2 process vents should make clear that <u>any</u> of the criteria must be met, in order for a vent to be classified as Group 2. EPA has appropriately constructed the definitions of Group 1 and Group 2 process vents to eliminate the highly probable Group 2 vents from further consideration on the basis of flow and concentration cutoffs. In addition, the TRE value cutoff is also used for determining Group 1/Group 2 process vent status.

EPA's definition of Group 2 process vent appropriately indicates that any of the listed exclusions allows a process vent to be classified Group 2. Accordingly, the word "or" is correctly included in the definition in section 63.111.

4. <u>EPA Has Reached Reasonable Criteria For Defining Group 1 Process Vents</u>

EPA has reached reasonable criteria for defining Group 1 process vents. The criteria EPA has chosen to determine group status for process vents include HAP emission rate, vent stream flow rate, vent stream net heating value, and total organic compound (TOC) vent stream content. CMA agrees that such parameters relate reasonably well to the proposed control requirements.

5. <u>The Definition Of Process Vent In Subpart F Should Also Include A Low Flow Cutoff</u>

The purpose of the weight percent HAP content cutoff in the subpart F definition of process vent is to eliminate from the substantial compliance requirements of the HON those vents that truly are insignificant and do not warrant additional paperwork for tracking. Flow rate is an additional criteria that EPA should add to the definition of process vent in subpart F. The low flow cutoff criteria of 0.005 scm per minute is sufficiently small to represent an insignificant vent stream for purposes of applicability determinations. This low flow cutoff value also ensures that such streams would not reasonably be considered Group 1 streams. An evaluation of the impact of this recommended low flow cutoff on the TRE determination is presented in Appendix F.

6. <u>EPA Should Revise Its Criteria For Defining Group 1 Storage Tanks</u>

In defining Group 1 storage vessels in section 63.111, the proposed rule specifies criteria for design storage capacity and stored-liquid maximum true vapor pressure. CMA agrees with the general approach used by the Agency in developing criteria for defining Group 1 storage tanks. For example, EPA has correctly distinguished between sizes of tanks and vapor pressures of materials stored. However, as discussed in section III.C.3. of these comments, EPA has significantly underestimated the control costs for large storage tanks and has, as a result, selected an inappropriate control level cutoff more stringent than the MACT floor for these tanks. The selection of the control level cutoff tanks is expressed in terms of the vapor pressure of the material stored, which in turn, defines the criteria for Group 1 storage vessels. CMA recommends that EPA revise the definition of Group 1 storage vessels consistent with our comments presented in section III.C.3., to use the MACT floor control element for these sources.

7. **EPA Proposes Reasonable Criteria For Defining Group 1 Transfer Racks But Should Clarify That The Rule Applies To Transfer Racks Or Arms**

In section 63.111 of the proposed rule, EPA has defined Group 1 transfer racks in terms of annual throughput of materials loaded and the rack weighted average vapor pressure of materials loaded. CMA agrees with these criteria. Vapor emissions are directly related to both throughput and vapor pressure of materials loaded. EPA has identified appropriate cutoffs for each of these criteria in defining Group 1 transfer racks.

Section 63.100(b)(5) of Subpart F specifies that when a transfer rack is shared by two or more chemical manufacturing processes, the applicability of the rule is determined separately for each loading arm. EPA should revise the definition of Group 1 transfer rack in subpart G to ensure consistency with the applicability provisions in subpart F.

8. **Allowance For Engineering Judgment Or Process Knowledge In The Definition Of Halogenated Vent Stream Should Be Expanded**

EPA proposes in its definition of halogenated vent stream in section 63.111 to only allow for engineering assessment or process knowledge to determine halogenated vent stream with no halogenated organic compounds are present. This same stipulation is also found in the procedural requirements in section 63.115(d)(2)(v).

CMA suggests another condition that warrants the allowed use of engineering judgment and process knowledge for use in determining the halogenated classification of a vent stream: specifically, where halogenation makes no difference to the end result of the TRE calculation. Engineering assessment or engineering or process knowledge should be an allowed alternative for determining the TRE index in these cases. For example, engineering assessment should be allowed when input variables to the TRE equation are calculated using all four coefficient alternatives and all four TRE values are greater than a value of four. In such cases, engineering knowledge, engineering assessment, or process knowledge, should suffice for the TRE determination. To do otherwise, adds additional compliance burden to the source owner or operator that makes no difference in the regulatory result.

9. **EPA Should Revise The Definition Of Point Of Generation**

As discussed in Section III.E.5 of these comments, CMA recommends that EPA revise the definition of point of generation.

10. **EPA Has Appropriately Defined The Reference Control Technology For Process Vents But Additional Consideration Is Needed For Process Vents With Existing Controls That Are Between 95 and 98 Per cent Efficient**

As discussed in Section III.B. 1 of these comments, CMA believes that the reference control technology for process vents with existing control devices that are between 95 and 98 per cent efficient should be reconsidered. Otherwise, we support the definition of reference control technology in the proposed rule.

11. EPA Should Revise The Reference Control Technology For Existing Storage Vessels

As discussed in III.C.2 of these comments, CMA believes that the reference control technology for existing storage vessels should be revised.

12. EPA Has Appropriately Defined The Reference Control Technology For Transfer Operations, But Additional Consideration Is Needed For Transfer Operations With Existing Controls That Are Between 95 And 98 Per cent Efficient

EPA has appropriately defined the reference control technology for transfer operations as a combustion device or recovery device, or a vapor balancing system. This definition ensures that vapors collected during loading operations are either returned to the storage vessel from which the material originated resulting in no emissions or captured and reduced in a control device. However, as discussed in Section III.D.3 of these comments, CMA believes that the reference control technology for transfer operations with existing control devices that are between 95 and 98 per cent efficient should be reconsidered.

13. EPA Must Redefine The Reference Control Technology For Wastewater

As discussed in Section III.E. of these comments, CMA recommends that EPA redefine the reference control technology for wastewater.

14. EPA Should Add A Mass Flow Threshold In Addition To The Halogen Cutoff For Defining Halogenated Vents

The proposed rule establishes a 200 parts per million by volume (ppmv) halogen cutoff level threshold for halogenated process vents. The rationale for this proposed cutoff level is not presented in the preamble to the proposed rule. Based on a review of EPA Docket A-90-19, Item II-B-260, CMA has determined that the apparent basis for the proposed cutoff level is a survey of facilities producing ethylene dichloride compounds. This data base is not sufficient to conclude that EPA has reasonably established the MACT floor element for halogen controls at 200 ppmv. It also brings about several undesirable results.

First, this cutoff precludes low flow streams containing halogen compounds from being introduced into existing process heaters and furnaces without triggering a scrubber retrofit even though exhaust from the heater or furnace would be insignificant and would likely meet the 20 ppmv outlet concentration requirement in section 63.113(a)(2). For example, a vent stream with the following characteristics would be considered halogenated under the proposed definition and would have a TRE of 0.99 and thus be classified as Group 1:

300 ppm halogen atoms

0.3 scmm flowrate at standard conditions (10 scfm)

23 MJ/scm heat content (600 Btu/scf)

6 Kg/hr HAP emission rate (13 lb/hr)

6 Kg/hr TOC emission rate (13 lb/hr)

If this stream were combusted in a three MM Btu/hr process heater, the resulting halogen concentration in the process heater exhaust gas would be less than 20 ppmv. A scrubber is an overly burdensome control mandate in this case, particularly when the emission rate of halogen is only 0.1 lb/hr or 60 times less than the threshold for control if the material were organic HAP.

Second, flaring of low flow halogenated vent streams is not allowed under section 63.113(a)(1)(ii) even though the quantity of halogen emitted from the flare would be approximately 30 times less than the threshold for control of non-halogenated vent streams. This, too, is an overly burdensome control requirement for insignificant quantities of halogens.

Third, no other option exists for treating acid gases and halogen discharges because these inorganic compounds are not allowed to be included under the emissions averaging provisions in the proposed rule.

CMA reviewed the basis for the selection of the 200 ppmv threshold as presented in the docket and offer the following observations.

- Halogen compound or atom concentration is a measure of "intensity or strength" but is not a measure of "magnitude or extent" such as mass flow rate. As a result, the defining criteria for halogenated vent streams includes insignificantly <u>sized</u> halogenated vent streams.
- The EPA data base upon which the halogen definition threshold was based includes only a narrow segment of SOCMI processes whose vent characteristics do not span the full range of Group 1 applicability of the TRE equation. This bias in the data base may result in counter productive control requirements for a collection of low flow, low halogen concentration vents not sampled by the EPA survey.
- EPA has applied the Texas Air Control Board (TACB) and Louisiana Air Control Board (LACB) statements that "flares are not normally used to control halogenated gas streams" as an absolute prohibition on flare use. TACB and LACB (according to Docket Item II-B-260) state they have no such prohibition but judge flare applicability on a case-by-case basis. CMA believes that such case-by-case analysis in these states allows for flaring of insignificant halogen content streams, otherwise

considered Group 1 by the proposal. For example, TACB Standard Exemption 80 exempts from new source review altogether up to 1.0 lb/hr of HCl emissions. Also, existing permits in Louisiana allow for intermittent flaring of halogenated containing streams.

- EPA has not considered as a floor, existing controls in similar facilities in selecting the halogen cutoff level. LACB and TACB probably rely on risk-based criteria for allowing halogenated vent streams to be flared and/or insignificant emissions to not require scrubbing. EPA also did not consider RCRA regulations for halogen emissions from waste incinerators. These regulations should be considered in determining the halogen control threshold and floor.

In light of these conclusions, CMA recommends the following provisions be added to the final rule to address the concerns described above regarding the 200 ppmv halogen cutoff level. Section 63.113(a)(1)(ii) should be revised as follows:

> "Halogenated vent streams, as defined in Section 63.111, shall not be vented to a flare <u>if the aggregated halogen content at the flare tip under routine operating conditions would exceed 4 lb/hr as halogen atoms."</u>

This threshold would allow emissions equivalent to the RCRA waste incinerator rule (40 CFR 264.343(b)) and thus exclude insignificant halogen-containing, Group 1 vent streams from burdensome and unnecessary scrubber controls. It would also allow the use of flares to control non-routine halogenated emissions.

In addition, section 63.113(a)(3) should be revised as follows:

"If a combustion device is used to comply with paragraph (a)(2) of this section for a halogenated vent stream on a routine basis, then the vent stream shall be ducted to a scrubber before it is discharged to the atmosphere <u>if the hydrogen halides and halogens emissions are greater than 4 lb/hr and the halogen atom concentration is greater than 20 ppmv at the combustion exhaust."</u>

This revision would allow for organic HAP control to be unaffected, mitigates a scrubber control burden on insignificant halogen-containing streams, and allows the economic use of existing process combustion devices.

With these additional provisions, CMA agrees that the 200 ppmv halogen cutoff level is reasonable considering resource and time limitations. CMA would expect the Agency to provide a more complete database and analysis for establishing a halogenation cutoff level should the Agency decide to change the threshold in the final rule.

B. PROCESS VENT PROVISIONS

1. <u>EPA Has Not Demonstrated That 98 Per Cent Control Of Group 1 Vents Is The Control Achieved For HAP's In Actual Practice</u>

EPA has proposed a 98 per cent control efficiency requirement for Group 1 process vents in section 63.113(a)(2). Sources are to determine whether a process event requires control by determining the TRE value for the vent stream. §63.115. The TRE determination requires information on the characteristics of the vent stream immediately following the final product recovery device (where one is used) and prior to any existing control device. For facilities with process vents that are equipped with control devices that are 98 per cent efficient for VOC but less than 98 per cent efficient for HAP's, this approach can result in a requirement to upgrade or replace the existing device with one that achieves 98 per cent control efficiency for HAP's. §63.116(c)(4)(c). This determination is based on the cost effectiveness of installing a new incinerator or flare and does not take into account already achieved reductions and the high cost-effectiveness for a marginal improvement in efficiency.

An example of where this situation is expected to occur is as follows. The NSPS for SOCMI Air Oxidation Vents specify 98 per cent efficient control of volatile organic compounds (VOC); however the standard allows the use of catalytic incineration to meet this requirement. 40 CFR part 60, subpart III. The BID in Volume 1B, Page 2-14 to the HON, however, points out that catalytic incinerators, while capable of achieving up to 98 per cent efficient control of VOC, can only achieve up to about 95 per cent efficient control of HAPs. Thus, existing facilities that have installed catalytic incinerators to comply with the Air Oxidation NSPS likely will be unable to comply with the HON using "new" source controls under NSPS.

After review of the BID and docket, CMA has been unable to determine that EPA has demonstrated that reference control technology for process vents can achieve 98 per cent efficiency for all section 63.104 organic HAP's. Instead, EPA seems to base the 98 per cent conclusion on the VOC removal levels achieved by NSPS rules. From review of the BID, EPA's discussion of RCTs is entirely framed in the context of VOC efficiencies and catalytic oxidation is the only combination control technology isolated for a particular discussion of HAP control efficiency. As such, the EPA has not fully addressed the actual control efficiencies for HAP's and thus the additional cost impact to existing facilities as part of its analysis of the cost impacts of going beyond the MACT floor control level for process vents. Preamble, p. 62631. EPA should verify the achievement of 98 per cent efficiency on HAP compounds, and/or include the actual retrofit costs and the incremental benefits to the environment for facilities that must remove existing control devices and replace them with slightly more efficient control devices as part of the analysis supporting the MACT control level for process vents.

The proposal at section 63.150 does allow that facilities with existing process vent control devices that are less than 98 per cent control efficiencies can elect the emissions averaging option. While CMA agrees that emissions averaging is a viable alternative that should be available to facilities, we are concerned that it should not be the only option available. Smaller facilities with few emission sources and small emission quantities may not be able to use emissions averaging. Also, the emissions averaging program contains more stringent recordkeeping and reporting requirements which make it more burdensome to implement. Facilities that have taken recent steps to improve performance, and in many cases, to comply with regulations, by installing control devices should not be penalized just because these control devices are slightly less efficient that 98 per cent on a HAP basis as opposed to a VOC basis.

Notwithstanding that EPA has not documented that the HAP's on the section 63.104 list can each achieve the 98 per cent reduction using the reference control technology. CMA recommends that, in addition to the emissions averaging provisions which should be retained, the final rule should specify that existing control devices that are at least 95 percent efficient are allowed to be retained for up to ten years until replacement is necessary due to major process changes, expansions, and other similar changes. Alternatively, the rule could specify that the TRE be applied after any existing control device if the control device achieves a 95 per cent or greater efficiency.

2. **The Final Rule Should Not Set MACT More Stringent Than The Floor For Process Vents**

As discussed in Section II.B. 4 of these comments, EPA has not justified establishing MACT more stringent than the proposed floor. EPA has failed to adequately evaluate the costs of emission reductions achieved beyond the MACT floor. It also has failed to take into account the fact that its approach for determining the source-wide MACT floor raises the stringency of the proposed floor. The Agency has underestimated control costs and overstated emissions reductions that will be achieved. EPA must correct these deficiencies in their analysis to support a decision to set MACT more stringent than the floor. Alternatively, EPA must set MACT at the floor level in the final rule.

3. **Engineering Estimates Are A Reliable Basis For Total Resource Effectiveness Calculations**

Section 63.115(d)(1) of the proposed rule establishes a TRE value above which engineering assessments are reliable for Group 1 determinations. CMA supports the inclusion of this provision. Resource requirements and costs in time and material can be substantial for measurements at a large number of vents. While measurement may be a reasonable requirement for vents with TRE values close to Group 1/Group 2 breakpoint, i.e., TRE = 1.0, such a requirement overburdens limited resources when other, less burdensome assessment methods can assure a vent is Group 2.

Engineering estimated quantities may reliably be used to determine a vent's Group 1/Group 2 status instead of measured quantities when information from best engineering estimates predict a TRE value greater than 4.0. This conclusion is based on an assessment by CMA that considered the accuracy that can reasonably be expected from best engineering estimates, the degree of error propagation relationship in the TRE equation, and calculation of TRE and confidence intervals for process vent data in the Agency's draft BID. The results of this assessment indicate that a TRE greater than 4.0 is more than sufficient to ensure that the inaccuracies in engineering assessment of the TRE input variables will not result in erroneously categorizing a Group 1 vent as a Group 2 vent. Details of this assessment are given in Appendix G. (Although the analysis in Appendix G is based on the December 24, 1991, draft HON, the conclusions are still valid. CMA is updating the analysis and will provide it to EPA.)

CMA supports the proposed basis and methods specified for calculating TRE values using engineering judgment. They will ensure that the estimate used for making the TRE determination are of equal quality to similar calculations used to establish permit limitations.

4. The Proposal Contains Reasonable Group 1 and Group 2 Thresholds

The proposed threshold for Group 1/Group 2 process vents is both rational and reasonable considering the amount of information available to the agency for the HON rule. The Group 1 and Group 2 thresholds for process vents are based on cost effectiveness of control. CMA has reviewed the procedures used by EPA for estimating the magnitude of control costs for process vents and has concluded that, in general, these costs have been properly estimated. However, as discussed in Section II.B.4 of these comments, CMA believes that the Agency's assessment of control costs relies on a number of conservative estimates which are not well substantiated. Also, in their analysis, EPA erroneously assigned non-attainment area controls to some operating SOCMI units when in fact, these facilities are known to be located in areas that are unclassified for ozone attainment. To the extent that these errors contribute to an overestimate of the floor, they also contribute to an overestimate of the cost effectiveness assigned to the TRE in determining its coefficients.

CMA believes that the Group 1/Group 2 threshold for process vents is reasonable at its proposed level when considering the resource and time limitations the agency experienced in developing the rule. However, if EPA chooses to revisit this threshold in the final rule, CMA believes that EPA must review and correct the basis for this determination, particularly with respect to those elements presented above.

5. **Group 2 Vents Should Be Subject To Minimal Monitoring, Recordkeeping, And Reporting**

As discussed in Section II.D.4.C. of these comments, CMA disagrees with the proposed monitoring, recordkeeping and reporting requirements in section 63.117 for Group 2 vent streams with TRE index values greater than 1.0 but less than or equal to 4.0. These monitoring, recordkeeping and reporting requirements are as costly and burdensome as those required for Group 1 process vents, in spite of the fact that EPA has appropriately concluded that Group 2 vent streams are not required to install controls. CMA urges the Agency to include only minimal monitoring, recordkeeping and reporting requirements for Group 2 process vents in the final rule.

6. **The Rule Properly Allows For Alternative Monitoring Parameters**

Section 63.114(c) of the proposed rule appropriately allows facilities to request approval to monitor parameters other than those specified in section 63.114(a) or (b). This provision properly provides flexibility to source owners and operators to identify other equally representative operating parameters or to use existing monitoring equipment for continuous monitoring. To be useful, this provision must be easy to implement. Specifically, the process for applying for approval must be simple and straightforward and the procedures for Agency review and approval must be timely and flexible.

In Section II.D.3. of these comments, CMA presents several specific recommendations regarding other alternatives to the proposed monitoring parameters that we believe should be included explicitly in the final rule. We recommend that EPA include these specific alternative approaches in the rule to prevent facilities and regulatory agencies from having to go through the process of applying for and granting approval of these alternative approaches on a case-by-case basis.

7. CMA Supports the Site-Specific Parameter Provisions

The proposed rule directs source owners and operators to establish site-specific parameter ranges that represent proper operation of control devices on process vents. The provision allowing for facilities to establish their own site-specific operating parameters correctly recognizes that there are site-specific differences in control design and vent stream characteristics. CMA does not support the imposition of a minimum value of monitored parameters. This would require the Agency to develop a complete understanding of all of the different combinations of control design and vent stream characteristics in the SOCMI industry. Such a task would be extremely resource consuming and would be unnecessary. It is more efficient and appropriate to allow facilities to select site-specific ranges of operating parameters that take into account their own unique circumstances.

8. Thirty Days Prenotification Is Adequate For Performance Tests

Thirty days pre-notification is adequate for performance tests. The testing plans and protocols EPA proposes for HON performance testing are similar to those testing requirements currently required by NSPS and several states standards. The current pre-notification time frame for tests is 30 days in many of these programs. CMA supports the proposed 30 days pre-notification requirement. CMA recommends that an explicit statement be added to the final rule indicating that this thirty day pre-notification limit overrides the 75 day pre-notifications limit in the draft and soon-to-be proposed General Provisions.

C. STORAGE VESSELS PROVISIONS

1. The Rule Appropriately Allows For Tank Improvements

Section 63.119(a) specifies two types of controls for Group 1 storage vessels: tank improvements (internal or external floating roofs with proper seals and fittings) or a closed vent system and control device. CMA agrees with EPA's determination that the costs of equipping every storage tank with a capture system would be prohibitively expensive. Preamble at p. 62638. The nature of emissions from many storage tanks is such that capture and control is not a cost-effective option. Therefore, we support the Agency's proposal to allow facilities to comply with the storage tank rules by installing internal or external floating roofs on certain tanks storing volatile HAPs, as an alternative to installing a closed vent system and control device.

2. <u>EPA Has Incorrectly Defined the Reference Control Technology For Existing Storage Tanks</u>

Section 63.119(a) identifies closed vent systems with a control device as a reference control technology for storage tanks. If an owner or operator uses this compliance option, section 63.119(e)(2) requires that the "control device shall be designed and operated to reduce inlet emissions by 95 per cent or greater." However, as reported in the BID, EPA found that existing storage tanks using refrigerated condensers to control emissions are required to achieve removal efficiencies of only 80 to 93 per cent (BID Volume 1B, p. 4-10 and 4-11). EPA has <u>assumed</u> that these existing refrigerated condensers are capable of meeting 95 percent removal efficiency. While it is true that refrigerated condensers can be purchased and installed that achieve 95 per cent removal efficiencies, EPA has not demonstrated that existing refrigerated condensers that were installed to comply with requirements for 80 to 93 per cent removal efficiencies are capable of achieving 95 per cent removal. In fact, data obtained by CMA indicate that for many existing tanks with refrigerated condensers the only way to comply with 95 per cent removal efficiency requirements will be to remove the existing refrigerated condenser and install a new one. (See Appendix H.)

One CMA member company reports that to achieve 95 per cent average recovery, the facility would have to replace its existing refrigerated condenser unit with a new, cascade (two-stage) system. Based on AP-42 equations, the additional emissions reduction from the new refrigerated condenser system would be 270 lb/yr. The additional cost to the facility to install and operate the new refrigerated condenser would be significant. The installed capital cost of the new unit would be $48,000 and the operating cost is estimated to be $6,500 per year, based on electrical requirements of 65,772 KWhr/year.

CMA does not believe that EPA intended for facilities that have existing storage tanks with refrigerated condensers to remove those condensers and replace them with new condensers. The incremental cost between a 90 per cent efficient and 95 per cent efficient refrigerated condenser is relatively small. However, this incremental cost does not reflect the actual cost to facilities with existing condensers that will have to replace them with new condensers. EPA did not consider nor has it justified the cost impact to facilities of replacing refrigerated condensers on storage tanks, as required under section 112(d) of the CAA. The costs of replacing refrigerated condensers is not merited by the small increase in control efficiency.

EPA has inappropriately defined the MACT floor element for existing storage tanks as 95 per cent control efficiency. Based on information in the record, current control requirements for storage tanks range from 80 to 93 per cent. Further, EPA did not evaluate the costs of 95 per cent efficient controls, as the statute requires if a MACT level above the floor is established, as was done in this case.

CMA recommends that EPA modify the reference control technology requirements in section 63.119 (e) for <u>existing</u> storage tanks to specify 90 per cent removal efficiency instead of 95 per cent. For <u>new</u> storage tanks, a 95 per cent removal efficiency requirement is appropriate since facilities will have the option of purchasing and installing a 95 per cent efficient condenser.

3. <u>EPA Should Set MACT For Large Storage Tanks At The Floor</u>

In the selection of proposed control requirements for large storage tanks, EPA has concluded, based on the available data, that an emission reduction more stringent than the level associated with the floor component for large vessels is achievable considering the statutory criteria. Among the available data considered by EPA in reaching this conclusion are the estimated costs for installing and operating the reference control technology, i.e., installing internal or external floating roofs or installing closed vent systems to a control device. Based on experience by CMA member companies in installation and operation of controls on storage tanks, we believe that EPA has significantly underestimated the costs for these technologies. In particular, CMA has not adequately considered the retrofit costs associated with installation of floating roofs on existing tanks and for installation of closed vent systems and control devices. Based on CMA estimates, it appears that EPA has understated actual reference control technology costs on existing large storage tanks by a factor of five. For new large storage tanks, we believe that EPA has underestimated actual costs by a factor of four. (See Appendix I).

By using updated control cost estimates for large storage tanks based on CMA data, we conclude that EPA should not set MACT at a level more stringent than the floor.

EPA is required by Section 112(d) of the Clean Air Act to consider the cost and economic impact (among other things) of control levels that are beyond the MACT floor before establishing them as MACT. The data that EPA used for making this assessment for large storage tanks is flawed and underestimates the actual control costs. Therefore, EPA has not adequately justified the proposed control levels for large storage tanks that are above the MACT floor. CMA recommends that EPA redo its cost analysis taking into account more accurate estimates for new and retrofit control systems on large storage tanks. CMA offers its assistance in developing more representative cost estimates for this analysis.

4. Seventy-Two Hours is An Insufficient Period For Routine Maintenance On A Control Device

If a source complies with the storage tank provisions by installing and operating a capture and control system, sections 63.120(d)(3) and (e)(3) allow sources 72 hours a year to perform routine maintenance. We do not believe that 72 hours will provide adequate time for an owner or operator to perform many typical maintenance procedures. For example, one CMA member company has reported that at least seven days is typically required to perform maintenance on flares. This level of maintenance is required infrequently, i.e., every few years, but would nonetheless put a source out of compliance with the storage tank standards of the rule, as proposed.

CMA recognizes that some maintenance operations can be completed within 72 hours and the rule should provide incentive for facilities to complete such maintenance procedures as quickly as practicable. Nonetheless, for those maintenance operations which can not be completed within 72 hours under any circumstances, CMA sees no reason to penalize facility owners or operators. Consequently, we recommend that the final rule allow for routine maintenance to be completed, provided that storage tank levels are not raised during that period. In other words, after the initial 72 hours, it would be unlawful to raise the level of material in a storage tank that is connected to a closed vent system and control device that is undergoing routine maintenance. Lowering a liquid level in a storage tank would be allowed (including operations as necessary to empty a tank).

5. Thirty Day Extensions Of The Repair Period Are Necessary

In section 63.120(a)(4) and (b)(7), EPA has appropriately provided for two 30-day extensions for repair of internal and external floating seal devices. A facility owner or operator may be unable to perform the required repairs during the time period specified under the rule due to circumstances that require the tank to be emptied before performing repairs. Some examples of circumstances that may prevent facilities from carrying out the required repairs within a specified time period include safety considerations such as tank shell corrosion, restricting safe access to the tank roof, and exposure of repair personnel to harmful vapors. Lack of available alternate storage capacity is another factor that may necessarily delay repair. EPA has correctly recognized that owners or operators should not be penalized for these circumstances by allowing up to two 30 day extensions for performing required repair procedures. Sources are required to provide adequate justification for each extension requested. CMA believes that the provisions for 30 day extensions are appropriate and necessary and should be retained in the final rule.

6. EPA Correctly Recognizes That Some Inspections of External Floating Roofs May Be Unsafe

The proposed rule properly recognizes that some inspections on external floating roofs may be unsafe. We support the provisions in section 63.120(b)(7), which allow for an extension of the inspection period when the owner or operator determines that it is unsafe to perform the seal gap measurements required under section 63.120(b) for external floating roofs.

7. <u>Compliance Extensions For Existing External Floating Roof Tanks Are Appropriate; EPA Should Also Allow Compliance Extensions For Tanks With Internal Floating Roofs</u>

Sections 63.119(c)(1)(iv) and (v) provide owners and operators of existing Group 1 storage tanks that are equipped with external floating roofs with seals that do not meet the specifications of the rule an extension of up to ten years to upgrade seals to meet the requirements of the rule if the seals already in place meet certain specifications. CMA supports this provision. In order to upgrade seals on external floating roof tanks, it is necessary to empty, clean, and degas the vessel. These operations result in emissions to the atmosphere which can easily exceed the reduction in emissions that can be achieved as a result of the seal upgrade. For example, retrofitting the seals from a base case of a vapor mounted primary plus a secondary seal to reference control which is a liquid mounted primary plus a secondary seal would yield about a 25 to 30 per cent emission reduction (based on API/AP-42 calculations for a 90 foot diameter tank storing material with a Reid vapor pressure of 9 psi). EPA has correctly recognized that this level of emissions reduction does not offset the emissions resulting from steps taken to empty and degas a tank. EPA has appropriately proposed to allow extended time (ten years or until the tank is next out of service) to retrofit the seals on an external floating roof.

The seal requirements for internal floating roof tanks in section 63.119(b) are very detailed and, as in the case of external floating roofs, some current internal floating roof seal configurations may not meet the specifications in the rule. In particular, storage vessels that are not currently subject to Subpart Kb of Part 60 have been fitted with internal floating roofs meeting other industry or regulatory standards such as Subpart K or Ka, which do not required the same type of seal configuration. As in the case of external floating roof tanks, the emissions that result from emptying and degassing an internal floating roof tank are potentially greater than the amount that will be controlled through immediate upgrade of the internal seals. Specifically, for existing internal floating roofs with a single vapor mounted (primary) seal, the emission reduction from adding a secondary seal above the vapor mounted primary seal would be 19 per cent (based on API/AP-42 calculations for a 90 foot diameter internal floating roof tank storing material with a Reid vapor pressure of 9.0 psi). Changing the seal to a liquid mounted primary seal would reduce emissions by 17 per cent. Therefore, it would be reasonable to also allow the same extended compliance time for internal floating roof tanks as for external floating roof tanks since the improvement available for internal floating roofs is even less than that for external floating roof tanks. CMA recommends that EPA include similar provisions for compliance deadline extensions for internal floating roof seals as found in section 63.119(c)(1)(iv) and (v) in the final rule for external floating roof seals.

8. **Closed Vent Systems On Storage Tanks Should Be Subject To Subpart H**

Section 63.119(e)(1) of the proposed rule for storage tanks contains requirements for operation of closed vent systems with no detectable emissions, as indicated by an instrument reading of less than 500 ppmv. Subpart H contains detailed requirements for leak detection and repair of equipment in VHAP service. The subpart H requirements are intended to ensure that equipment handling VHAP materials that can leak are operated and maintained in such a way that low leak frequencies are achieved. CMA is unaware of any reason why closed vent systems for storage vessels are different from the other types of equipment subject to subpart H. Therefore, we see no reason why closed vent systems on storage tanks should have a separate requirement developed. Instead, they should be subject to the subpart H requirements. To reduce confusion and overlapping of subparts G and H, CMA recommends that the requirements for no detectable emissions from closed vent systems on storage tanks be deleted from subpart G. It is also necessary to add a provision for delay of repair in section 63.171 to include closed vent systems since these closed vent systems are often shared with process vent controls.

9. **Requirements To Notify the Administrator Of Seal Gap Measurements Are Unnecessary And Should Be Dropped**

Under section 63.122(h)(2), the proposed rule requires owners or operators to notify the Administrator in advance when a facility plans to perform seal gap measurements required by section 63.120. This notification requirements represents an unnecessary burden for facility owners and operators. It is highly unlikely that a regulatory agency will have the resources to provide an observer for these measurements as the proposed rule envisions. Consequently, this type of notification represents "notification for notification's sake" and should be eliminated. It is sufficient to require facilities to retain a record on-site of when such seal gap measurements are performed and include results in periodic reports.

10. **Storage Tank Equations Should Be Updated In The Final Rule To Reflect The Latest Changes to AP-42**

EPA recently published a supplement to the Compilation of Air Pollutant Emission Factors (AP-42). Supplement E, dated October 1992, contains a new Chapter 12 entitled, "Storage of Organic Liquids." EPA intends for this chapter to replace the old Section 4.3 of AP-42 with the same title, which was last updated in September 1985. The proposed HON does not reflect new material contained in Supplement E, based on our review. Although

Supplement E makes few changes to the calculations recommended in Section 4.3 of AP-42, the changes that have been made are not included in the proposed HON.

CMA has performed an evaluation of the storage tank equations in Supplement E of AP-42 versus the HON which is included as Appendix J to these comments. CMA recommends that EPA update the storage tank equations in the final HON to reflect the latest changes in AP-42.

D. TRANSFER OPERATIONS PROVISIONS

1. EPA Has Appropriately Handled Vapor Balancing

In the proposed rule, EPA has appropriately provided that facilities that operate transfer racks with vapor balancing are not subject to subpart G requirements for transfer operations. At the same time, EPA has allowed facilities that elect to comply with the emissions averaging provisions of the rule to use vapor balancing as a control option. CMA supports this approach for handling vapor balancing in the rule. Vapor balancing systems operate by collecting vapors displaced from rail and tank cars during loading and routing them to the storage vessel from which the liquid originated. Where technically feasible and appropriate, vapor balancing is used to control emissions from existing transfer racks. Further, it is a good example of a pollution prevention technique which should be encouraged. Because there are no emissions to the atmosphere, EPA correctly provides in section 63.110(d)(1)(ii) that transfer racks using vapor balancing are excluded from the definition of transfer rack and thus are required to be not subject to the transfer operations provisions in subpart G. CMA notes, however, the inclusion of vapor balancing in the proposed HON as a control option for transfer racks in facilities that elect to comply with the emissions averaging provisions. In this case, CMA believes that the additional two per cent emissions reduction achieved by vapor balancing can appropriately be used as an emission credit.

2. DOT Certification Assures Adequate Vapor Tightness

The proposed rule for Group 1 transfer racks requires facility owners or operators to ensure that vapors captured by the collection system are not lost to the atmosphere through leaks in the vehicle in one of two ways. Section 63.126(e)(1) restricts loading of organic HAPs only into trucks and railcars that have a current certification in accordance with the U.S. Department of Transportation (DOT) pressure test requirements of 49 CFR part 180 for tank trucks and 49 CFR 173.31 for rail cars. Alternatively, section 63.126(e)(2) requires a demonstration of vapor tightness within the preceding 12 months for all truck and rail cars loaded.

CMA supports the provision allowing facilities to comply with the rule by loading only truck and rail cars that have proper DOT certification. Current DOT regulations already require testing and periodic re-testing of tank cars and tank trucks. Any additional testing would be duplicative and unnecessary. Testing information is required to be stenciled on the vessel shell. This testing and marking is a responsibility of the vessel owner. The proposed HON correctly recognizes the role of vessel owners in ensuring their equipment are adequately pressure tested. CMA recommends that section 63.126(e)(1) be retained in the final rule, as proposed.

3. **<u>EPA Has Not Demonstrated That 98 Percent Control of Existing Group 1 Transfer Racks Is The Control Achieved For Haps In Actual Practice</u>**

In a previous comment in Section III.B.1., we stated that EPA's evaluation of the reference control technology for process vents does not adequately demonstrate that 98 percent control efficiency of HAPs is achievable for existing control devices. EPA has proposed the same reference control technology for controls on transfer racks. For the same reasons set out above, we recommend that EPA either verity that 98 per cent control of HAPs is achievable for existing control devices on transfer racks or include the actual retrofit costs and incremental benefit to the environment for facilities that must remove existing control devices and replace them with slightly more efficient control devices.

4. **<u>The Rule Should Provide For Extension Of The 15-Day Repair Period</u>**

Section 63.126(a)(3)(i) requires indicated leaks be repaired no later than 15 calendar days after detection. Some loading racks may be operated sporadically and may have more than 15 days between loading events. Until the next loading event occurs, there is no opportunity to determine whether a repair is successful. Moreover, there is no opportunity for emissions to occur from the transfer rack until the next loading event. The final rule should recognize this by allowing repairs to be completed within 15 calendar days, or the next loading event, whichever is later.

5. **<u>The Rule Should Clarify The Calculation of An Annual Rack Weighted Average HAP Vapor Pressure</u>**

Section 63.130(g)(3) requires an analysis documenting the annual rack weighted average HAP vapor pressure of the loading rack. There is no discussion on how to calculate the vapor pressure of the HAP. To simplify the calculation, the vapor pressure should be established at the average annual temperature of the material loaded at the facility.

6. Closed Vent Systems on Transfer Racks Should Be Subject To Subpart H

Section 63.126(a)(3) of the proposed rule for transfer operations contains requirements for operation of vapor collection systems with no detectable emissions, as indicated by an instrument reading of less than 500 ppmv. Subpart H contains detailed requirements for leak detection and repair of equipment in VHAP service. The subpart H requirements are intended to ensure that equipment handling VHAP materials that can leak are operated and maintained in such a way that low leak frequencies are achieved. CMA is unaware of any reason why vapor collection systems on transfer racks are different from the other types of equipment subject to subpart H. Therefore, we see no reason why vapor collection systems on transfer racks should have a separate requirement developed. Instead, it should be subject to the subpart H requirements. To reduce confusion and overlapping of subparts G and H, CMA recommends that the requirements for no detectable emissions from vapor collection systems on transfer racks be deleted from Subpart G. It is also necessary to add a provision for delay of repair in section 63.171 to include closed vent systems since these vapor collection systems may be common with process vent controls.

E. WASTEWATER PROVISIONS

1. EPA's Emission Factors, Strippability Estimates, and National Emissions Estimates Are Based On Outdated and Inaccurate Information. EPA Should Use Data Supplied By CMA and Member Companies To Reevaluate The Bases Of The Proposed Regulation

CMA believes the rulemaking record fails to support some of the fundamental wastewater provisions in the HON. In particular, the emission factors, strippability estimates, and national emission estimates used by EPA as bases for proposed wastewater provisions in the HON are based on outdated and inaccurate information. Over the past few months, CMA and its member companies have supplied new information to EPA to update their erroneous and out-of-date data. We strongly recommend that EPA use the information supplied by CMA to reevaluate the bases of the proposed regulation. Failure to do so will result in a final rule that is technically unsupportable.

a. EPA Must Update All Emission Factors And Strippability Estimates Using Revised Physical Properties Data, Refined Emission Models, And The Realistic SOCMI Plant Wastewater Management Scenarios Supplied By CMA

There are a number of changes that have been made by EPA, in response to round table discussions with CMA, to the physical properties data for the volatile organic hazardous air pollutants (VOHAPs). Also, in response to this request for comments on the proposed rule, additional data on the physical attributes of SOCMI wastewater treatment systems will be available to refine the emissions estimating methods. Improved methods for estimating emissions from some wastewater collection system components are also available as described in these comments and its appendices.

CMA has prepared estimates of Henry's law coefficients at 100 °C, which should be used in all steam stripper calculations. These coefficients are shown in Appendix K. Appendix K demonstrates that the American Institute of Chemical Engineers (AIChE) model is appropriate for estimating stage efficiencies. CMA suggests that EPA utilize this model in their completion of the regulatory program. In addition, as described elsewhere in this report, CMA has calculated VOHAP-specific tray efficiencies that should be used to calculate accurate estimates of stripping performance.

The three wastewater collection and treatment scenarios used by EPA to calculate VOHAP emission factors and nationwide emission estimates are not an accurate assessment of SOCMI wastewater collection and treatment practices and substantially overestimate emissions. CMA has provided EPA with an inventory of representative SOCMI plant wastewater management system scenarios. Figure 1 shows representative collection system components, and Figure 2 illustrates representative wastewater treatment system components. Use of the more representative wastewater management scenarios provided to EPA by CMA will result in more realistic estimates of existing emissions from SOCMI facilities' wastewater management practices.

These improved data will allow more reliable estimates of the VOHAP-specific emission factors (Table 13 of the proposed rule) and strippability factors (Table 33 of the proposed rule). Notwithstanding changes in the proposed rule in response to CMA's comments on specific issues and procedures, EPA should use the more reliable physical property data and improved emissions estimating procedures for development of the final rule.

Figure 1 - Collection System

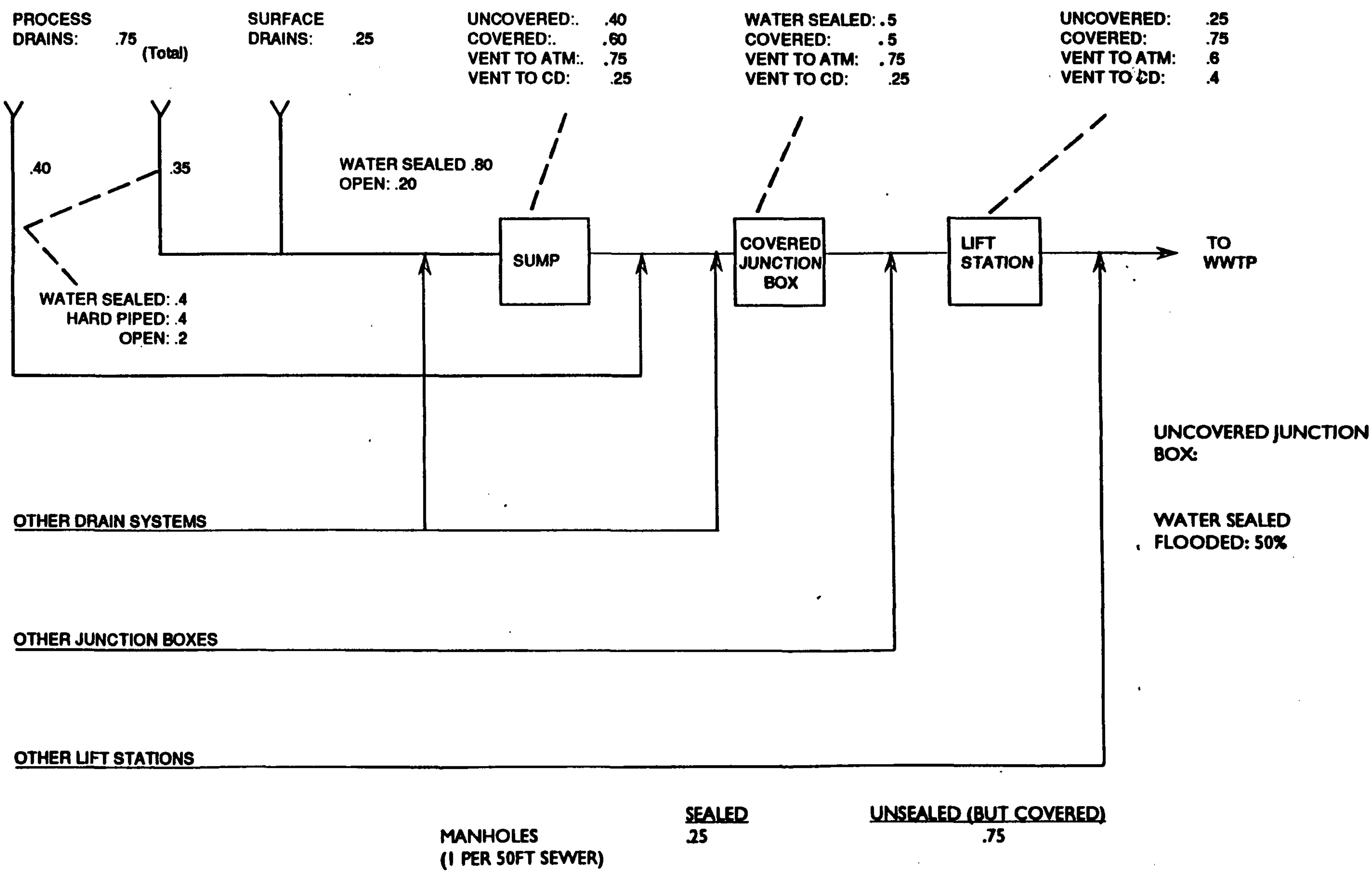
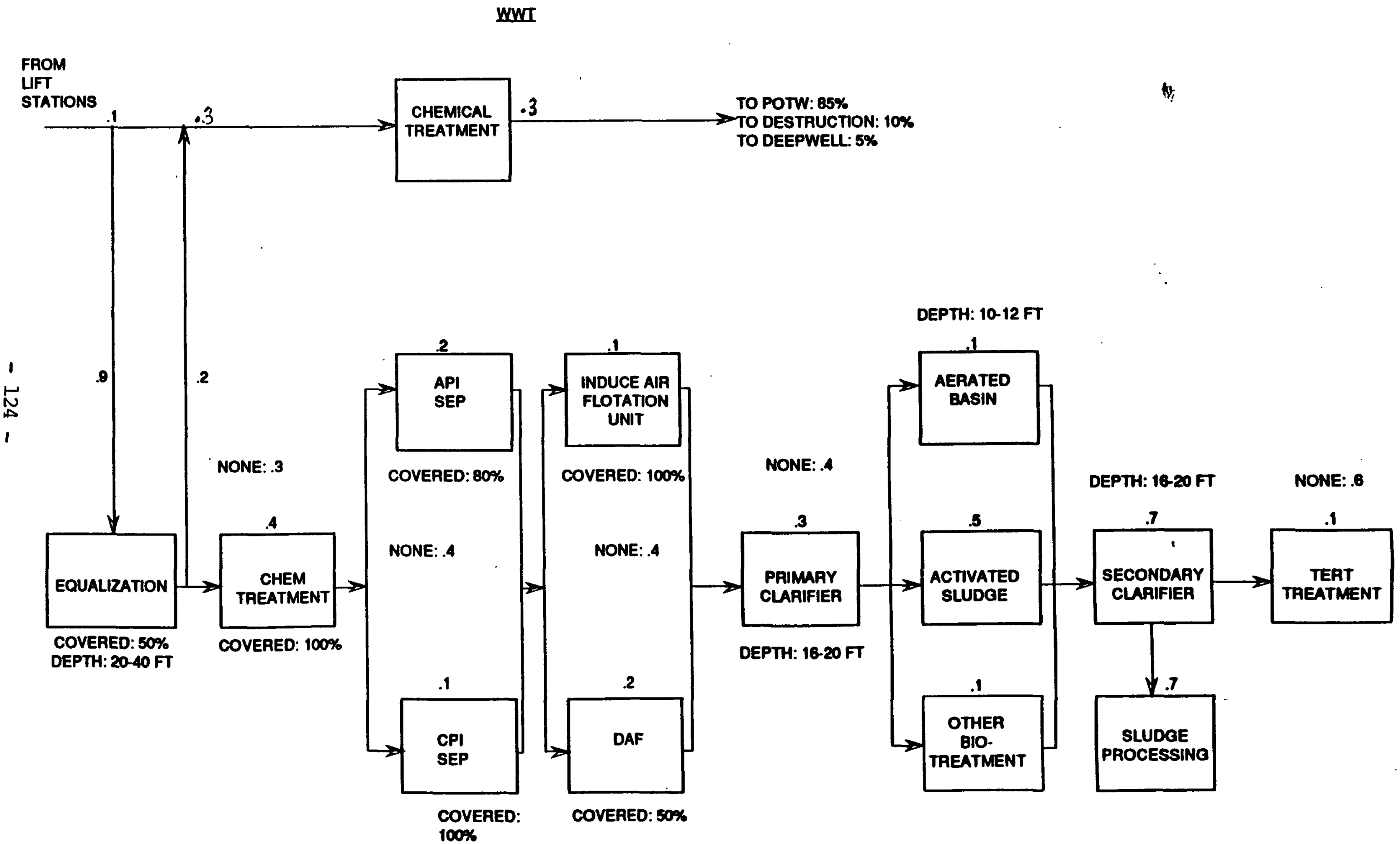


Figure 2 - Wastewater Treatment Scenario



b. EPA Has Correctly Excluded From Regulation Organic HAPs That Have Little Potential To Emit from Wastewater Collection And Treatment Systems.

There are a number of organic HAPs that EPA originally considered as candidates for identification as VOHAPs. Examples of such HAPs include chemicals such as phenol, ethylene glycol, and p-cresol, which are poorly steam-stripped, if at all, and which by EPA's own calculations have a very low potential to emit from SOCMI wastewater collection and treatment systems.

EPA's estimates of the strippability of the compounds that it has excluded from the rule, when compared to the Agency's predicted emissions from wastewater collection and treatment units, justifies the decision not to regulate such compounds. The Agency's calculations for the three example compounds listed above are as follows:

Chemical	Per cent steam stripped	Per cent emitted
p-cresol	8	10
ethylene glycol	0	1
phenol	9	11

As noted in these comments, EPA's estimates of its RCT steam stripper performance are grossly overoptimistic, while its estimates of emissions during wastewater collection and treatment are overstated -- especially for biological treatment. It is apparent even from these figures, however, that if a compound cannot be stripped by steam at a temperature of 100 °C in a treatment unit that is designed to maximize removal, it is not going to be emitted from a collection system and wastewater treatment units that typically operate at temperatures of 30 to 40 °C.

In addition, the compounds that EPA has excluded from regulation are biodegradable and are very effectively treated in SOCMI wastewater treatment systems. Chemicals such as phenol, ethylene glycol, and the cresols are all very biodegradable and are essentially 100 per cent removed in biological treatment plants.

CMA strongly supports EPA's decision to exclude chemicals with minimal potential to be emitted from wastewater management systems from regulation as VOHAPs. The scientific data that supports this decision are complete and conclusive.

c. There Are Chemicals Identified As VOHAPs In The Proposed Rule Which Have Little Potential To Be Emitted From Wastewaters And These Should Be Excluded From The Final Rule.

Although the Agency has excluded a number of organic HAPs from regulation by the wastewater HON, there remain a number of chemicals on the VOHAP list that have little potential to be emitted during wastewater collection and treatment and that are poorly removed by the RCT steam stripper. These compounds should also be excluded from regulation.

Methanol is one good example of such a compound. It also is a good example of how EPA's methodology overestimates wastewater system emissions for some chemicals. Table 13 of the proposed rule shows projected emissions of methanol during wastewater collection and treatment as 27.8 per cent of the initial mass discharged to the collection system. Table 33 of the proposed rule predicts that 82.9 per cent of methanol can be removed in the RCT steam stripper, however, as shown elsewhere in these comments, EPA has overestimated the strippability of methanol by perhaps 100 per cent. It has also overestimated the emissions from the collection system.

CMA contracted with Enviromega to measure emissions of selected VOHAPs from drop structures and process drains. This study examined a number of different conditions for both types of collection system components. These are the collection system components that EPA identifies in its prediction methodology as the major emitting sources in collection systems.

The Enviromega tests showed that methanol was not measurably emitted from drop structures or process drains under any of the conditions examined, which represented the range of conditions found in full-scale collection systems. This is not a surprising finding, since the properties of aqueous methanol solutions are such that volatilization of the methanol occurs very slowly. In addition, it is well-documented that methanol is biodegradable in acclimated biological treatment units. As shown in these comments, the WATER7 model predicts that methanol will be 99 per cent biodegraded in a SOCMI activated sludge unit. What is surprising is that EPA's methodology predicts that 27.8 per cent of the methanol in wastewater will be emitted during collection and treatment. This overprediction is not unique to methanol, it is also likely to be present in the predicted emissions for other VOHAPs with chemical properties similar to methanol.

Examples of chemicals currently identified as VOHAPs that clearly should not be considered as such include:

aniline
3,3'-dimethylbenzidine
1,1-dimethyl hydrazine
dimethyl sulfate
2,4-dinitrotoluene
diethylene glycol dimethyl ether
ethylene glycol monomethyl ether acetate
diethylene glycol diethyl ether

ethylene glycol monomethyl ether acetate
o-toluidine.

All of these chemicals have low potential to emit (fraction emitted, Fe) during wastewater collection and treatment according to EPA's overly conservative prediction methods. All of these chemicals and any others that meet this criterion should be excluded from the final rule. CMA believes that when this reevaluation is performed, EPA will determine that the only HAPs that are likely to be emitted during wastewater collection and treatment are the very volatile VOHAPs shown in Table 8 of the proposed rule.

2. EPA Has Failed To Support Steam Stripping As The Reference Control Technology

EPA has not provided in the public record the data and calculations needed to support the VOHAP strippabilities presented in Table 33 of the proposed rule (57 Fed. Reg. 62759). This absence of documentation for the RCT performance estimates, which arguably is the most important single component of the proposed wastewater rule, represents a deficiency that cannot withstand legal challenge. EPA has notified a member of CMA Secondary Emissions Work Group that it could not find the majority of the supporting information for the steam stripping calculations and performance estimates (Appendix L, Letter from J. Meyers to J. Schroy). Before the final HON rule is promulgated, the Agency must make available in the public record the complete methodology, and supporting calculations, that it uses to develop the performance efficiencies (strippabilities) on which it proposes to base the steam stripping RCT.

Absent the necessary technical information that describes EPA's methodology, CMA has based its evaluation of EPA's steam stripping performance estimates on the Agency's verbal descriptions of how it calculated strippabilities.

a. EPA' Should Estimate The Strippability Of Each VOHAP Individually, Or Revise The Strippability Applicability Projections Using Methods Recommended By CMA

Based on discussions with EPA, CMA understands that the Agency used the same approach to develop the HON steam stripping estimates for wastewater as it used for the EPA's background information document (BID) for industrial wastewater volatile organic emissions (*Industrial Wastewater Volatile Organic Compound Emissions - Background Information for BACT/LAER Determinations*, EPA-450/3-90-004, January 1990) (BACT/LAER BID). If this understanding is accurate, EPA estimated the steam stripping efficiency (strippability) using a log linear regression equation that relates the stripping efficiency of a specific VOHAP to the Henry's Law coefficient of that HAP. This regression curve was calculated from stripping efficiencies estimated using an EPA modified version of the Advanced System for Process Engineering (EPA-modified ASPEN) software and the assumed steam stripper design in Appendix D.2.2. of *Hazardous Air Pollutant Emissions from Process Units in the Synthetic Organic Chemical Manufacturing Industry -- Background Information for Proposed Standards, Draft EIS*, Volume 1B: Control Technologies, EPA-453/D-92-016b (EIS). EPA-modified ASPEN was used to calculate the removal by steam stripping for six compounds representing the upper and lower limits of three assumed Henry's Law coefficient volatility groups -- high ($>10^{-3}$ atm-m^3/mol), medium (10^{-5} to 10^{-3}), and low ($<10^{-5}$). The strippability factors for all other VOHAPs in

Table 33 of the proposed rule were estimated from the resulting regression equation using their Henry's Law coefficients.

This methodology is inherently inaccurate because it assumes that the strippability of specific organic compounds is log linearally related to their Henry's Law coefficients at 25 °C and does not consider any other physical properties of the compounds that may affect strippability.

As shown by a study performed for CMA and submitted to EPA (ENSR Consulting and Engineering, *Simulation of Steam Stripping of Wastewater Under the Proposed HON Rule*, May 1992), the relationship between strippability and the logarithm of a compound's Henry's Law coefficient is sigmoidal rather than linear and the linear assumption used by EPA introduces significant error into the estimates of strippability for many VOHAPs. In fact, ENSR found, by calculating the strippability of 26 VOHAPs with ASPEN, that even the sigmoidal distribution did not fit the strippability data well in the range from $5x10^{-6} < H < 5x10^{-5}$ atm-m^3/mol where stripping efficiency increases very rapidly with increasing Henry's Law coefficients. This is because stripping efficiency is not only a function of Henry's Law coefficient, but is also a function of other chemical properties such as solubility and activity of chemicals in a mixture.

For Group A, B, and C VOHAPs (Table 9 of the proposed rule), EPA's estimates are inaccurate and may overestimate the achievable strippability for a number of chemicals. The 80 per cent tray efficiency assumed for the design steam stripper is greatly overestimated. The tray efficiency is a function of the vapor/liquid ratio which EPA has ignored in this conceptual design.

Dr. James Fair of the Department of Chemical Engineering at the University of Texas at Austin has calculated the tray efficiencies for each VOHAP (Table 9) using the Kremser equation. Dr. Fair's technical report on tray efficiencies and the Fractionation Research Institute toluene/water stripping study is attached to these comments (Appendix K).

If steam stripping is used as an RCT for wastewater, it is critical that the estimates of strippability used in the rule be as accurate as possible. As a minimum, EPA should perform its strippability projections using the methodology followed by ENSR -- (1) use ASPEN simulations for 25 or more HAPs that fully represent the range of volatilities in Groups A, B, and C to establish the points for regression analysis; and (2) use a logit transformation of the strippability and the logarithm of the Henry's Law coefficients for each of the simulated chemicals to develop the regression curve.

It would be most technically defensible, however, for EPA to estimate the strippability of each Group A, B, and C VOHAP individually with ASPEN or an alternative simulation method in order to accurately account for each chemical's properties. CMA recommends that EPA follow this approach, and individually simulate with the Kremser equation the strippability for each VOHAP that it proposes to regulate using steam stripping as the RCT.

b. Target Steam Stripping Removal Efficiencies For Group B And Group C Compounds Should Be Consistent With Their True Strippability —— They Are Not For A Number Of Such Compounds

EPA has established three target levels of strippability that must be achieved by any wastewater management technology that is to be considered equivalent to the RCT. These levels are: Group A - 99 per cent; Group B - 95 per cent; and Group C - 70 per cent.

As CMA has pointed out to EPA in previous discussions, these groupings are not an accurate representation of the range of strippabilities of HAPs within the groups. Preamble at p. 62643. This can result in compliance demonstration problems for wastewaters containing specific chemicals, as described by EPA in the preamble to the proposed rule (57 Fed. Reg. 62643).

This problem with the current proposal is demonstrated by comparing the group target strippability levels with EPA's estimates of strippability for specific VOHAPs, as presented in Table 33 of the proposed rule. A few examples are as follows;

	Table 9 target level	Table 33 strippability
Group B		
acetophenone	95 %	92 %
2,4-dinitrophenol	95 %	90.8 %
nitrobenzene	95 %	93.6 %
Group C		
aniline	70 %	46.8 %
1,4-dinitrotuluene	70 %	62.6 %
o-toluidine	70 %	48.7 %

Using EPA's data, it is abundantly clear that establishment of a single compliance target removal percentage for a diverse group of chemicals with a wide range of strippabilities is fundamentally inequitable. EPA's proposal assigns target removal efficiencies to many chemicals that are well beyond the capabilities of its proposed RCT. Any facility attempting to demonstrate equivalency of an alternate treatment technology or different steam stripper design would be forced to meet a target that EPA's RCT could not achieve. This approach is inequitable and technically unjustifiable and must be changed.

CMA urges EPA to establish target levels for individual VOHAPs which are based on that VOHAP's treatability with an RCT, for whatever RCTs are finally selected for wastewaters. In the case of steam stripping, this means EPA should individually calculate with the Kremser equation the strippability of each VOHAP to be regulated, since it has earlier been demonstrated that the Agency's regression-based stripping estimates are unrepresentative.

c. The Strippabilities Are Overestimated For Some Group B And Group C Compounds, And Will Not Be Achievable In Full-scale Steam Strippers

Because EPA has not correctly calculated the strippability factor for each VOHAP proposed for regulation, but rather has used an unreliable regression equation, it has estimated strippabilities for some compounds that exceed the removal performance that can be obtained with steam stripping. In addition, as discussed elsewhere in these comments, EPA has used tray efficiency assumptions that are unrealistically high. CMA has had the individual VOHAP strippabilities calculated with the Kremser equation and these are shown in Appendix K.

ENSR (1991) ran the most recent publicly-available version of the ASPEN model for 26 of the VOHAPs identified in the proposed rule, using the same steam stripper design conditions as assumed by EPA. For the Group B and C compounds modeled by

ENSR, the strippabilities shown by EPA in Table 33 of the proposed rule as compared to the actual ASPEN calculations are as follows:

	Table 33	ENSR ASPEN
Group B		
acetophenone	92 %	86.1 %
2,4-dinitrophenol	100 %	99.1 %
nitrobenzene	100 %	76.1 %
Group C		
aniline	46.8 %	15.2 %
1,4-dinitrotuluene	93.4 %	16.3 %
o-toluidine	82.9 %	13.0 %

EPA's Engineering and Analysis Division (Office of Water) recently completed a steam stripping study at a pharmaceutical plant to collect data for possible revisions in the pharmaceutical manufacturing effluent limitations guidelines. The results of these pilot-scale studies are discussed in the final report on the project (Gardner, D.A., et.al., *Treatment of Pharmaceutical Wastewater by Steam Stripping and Air Stripping*, EPA Contract No. 68-C0-0003, Risk Reduction Engineering Laboratory, Cincinnati, September 1992). This report has been submitted by CMA to become part of the HON docket.

A large pilot scale steam stripper (packed column - one-foot diameter, 16 feet of packing, height equivalent of a theoretical tray = 15 inches, steam rate = 380 lb/hr, and wastewater flow rate varied from 3.6 to 10 gallons per minute) was used for these tests to provide accurate estimates of full-scale stripping performance. The study concluded that for the oxygenated contaminants investigated (methanol, ethanol, acetone, and isopropyl alcohol), the ASPEN simulations of the pilot plant data were successful for less than 2/3 of the comparisons for ethanol, acetone, and isopropanol. In the case of methanol, the simulations adequately correlated with the pilot plant results for less than 50 per cent of the test runs. This indicates that even if simulation analysis is used on individual VOHAPs, for some compounds these simulations may not be reliable estimates of steam stripper performance.

The pharmaceutical steam stripping pilot study also demonstrated poor steam stripping of oxygenated organic compounds. Methanol removals in the pilot stripper averaged 46.8 per cent for 11 separate steam stripping tests on two different feed streams. These tests, with actual wastewaters treated in a large pilot-scale steam stripper, demonstrate that EPA's strippability estimates in Table 33 of the proposed rule are inaccurate for some compounds and cannot be achieved. Furthermore, this pilot study pointed out that for non-ideal VOHAP/aqueous systems, very good data are required to reliably predict stripper performance using a simulation model, including ASPEN. This is not a failure of the simulation model, but rather represents the use of inappropriate assumptions and characteristics for the wastewater being stripped.

The discrepancies between EPA's estimated steam stripping efficiencies and those calculated directly with the ASPEN model using the Agency's assumed steam stripper design are highly significant. The failure of ASPEN to accurately predict stripping performance of oxygenated HAPs, which is a result of assuming ideal physical characteristics for a non-ideal system, magnifies the problem with EPA's strippability estimates. Since EPA has used its estimated strippabilities to define the effectiveness of the proposed RCT compared to the existing levels of emissions, it has overestimated the cost-effectiveness of the proposed rule. Facilities that install the RCT-design steam stripper will not achieve EPA's estimated emission reductions for such chemicals. Furthermore, because facilities will be required to use the strippabilities in Table 33 of the proposed rule to demonstrate equivalency of alternate control technologies to the designated RCT, they will be comparing the performance of alternate systems to a level of performance that cannot be achieved by EPA's design steam stripper. These problems significantly undermine the basis of EPA's proposed RCT and HON rule, and must be corrected.

d. EPA's Cost And Environmental Impact Analyses For Steam Stripping Are Inadequate, Resulting In underestimated Costs And Overestimated Benefits For The Proposed Rule

EPA has estimated the costs of steam stripping assuming that the VOHAPs collected in the overhead can be recycled to the process or used as fuel within the plant (Section 2.2.3, Volume 1B, EIS). Therefore, EPA actually takes a credit on the operating costs of the steam stripper for recovery of the heat value of the steam stripper overhead stream (Table D-6, Volume 1B, EIS). This assumption indicates that the Agency is unfamiliar with industry practice and its own RCRA hazardous waste regulations.

In most cases, the overheads from a wastewater steam stripper will contain too many unwanted organic contaminants to recycle the condensed organics to the process. EPA has ignored the fact that one of the functions of wastewater streams in SOCMI processes is to remove unwanted reaction byproducts from the primary product and intermediates. Obviously, these cannot be returned to the process. Many of the condensed organic streams from the overhead will be hazardous wastes, either due to ignitability (D001) or the toxicity characteristic (TC)(40 CFR part 261). Many of the regulated

VOHAPs are halogenated organics, and few facilities are willing to burn such compounds in boilers and furnaces because of corrosion potential and the difficulties of emission control. Burning these residuals on-site in boilers or furnaces for their fuel value (the non-halogenated VOHAPs) now requires monitoring, testing, and permitting of the boiler or furnace to meet RCRA hazardous waste requirements. There are also limitations under RCRA on what can be considered a true recycle system that is exempt from hazardous waste regulations. The significance of these facts is that even for plants that manage the condensed organics from steam stripping on-site, there will be a significant net cost of operation, not an economic benefit as EPA has assumed.

At many plants, the only viable alternative for management of the steam stripper overhead condensed organics will be off-site disposal as a hazardous waste. Even this method of disposal may become problematic, based on recent CMA member company experience with the benzene NESHAP rule. Some hazardous waste treatment, storage, and disposal facilities (TSDF) are refusing to accept residuals from benzene waste operations that are subject to the NESHAP, because they are not equipped to meet the emission control requirements specified by the rule i.e., the same emission controls required of the waste generator. Since the proposed SOCMI wastewater HON contains similar provisions to the benzene NESHAP, which would require TSDFs to manage residuals with the same emission controls as used by the SOCMI generator, finding TSDFs to accept the steam stripper overhead condensed organics may be difficult. This may limit the available TSDF capacity for these residuals, causing the price for disposal to increase above the typical commercial hazardous waste treatment and disposal costs. In such cases, the costs of disposal may be a significant fraction of total annual operating costs. The Agency has not only totally ignored these costs in its analysis, it has transformed them into a net economic benefit.

Other aspects of EPA's steam stripper design also underestimate the actual costs of steam stripping. These include:

1. EPA has assumed that the stripper column can be designed of carbon steel (with stainless steel trays and pumps). This column design may only be applicable in a limited number of cases; a more reasonable assumption for industry-wide cost estimates would be a stainless steel column. The increased equipment cost for constructing EPA's RCT steam stripper with stainless steel is $271,000 ($330,000 for carbon steel and $601,000 for stainless steel). This represents an additional equipment cost of 82 per cent for the RCT steam stripper that EPA has not considered in its cost-effectiveness analysis.

2. EPA has assumed a heat transfer coefficient for 180 Btu/hr per square foot per degree F for the feed preheater. While this value may be achieved for high velocities and clean service, it is not appropriate for design. A transfer coefficient of 130 Btu/hr per square foot per degree F is more appropriate for a shell and tube heat exchanger in aqueous to aqueous service.

3. EPA's shell and tube heat exchanger is only appropriate for wastewaters with no suspended solids. The low velocities on the

shell side of the exchanger will cause particulates to settle and foul the exchanger. Since many SOCMI process wastewaters contain suspended solids, a plate and frame exchanger is a more realistic design assumption.

4. EPA has not addressed the disposition of the aqueous phase from the decanter. Because of the aqueous solubility of many of the VOHAPs targeted by this rule, this stream must be managed and the cost of such management must be included in the cost-effectiveness calculations.

5. EPA has assumed a tray efficiency of 80 per cent in its RCT design, which overestimates stripping performance because achievable efficiency is less. Thus, to achieve EPA's target strippabilities for less-strippable VOHAPs a bigger column and more steam would be required, increasing both the capital and operating costs of the steam stripper.

The Agency has also not adequately considered the energy costs and environmental impacts of steam stripping. Steam stripping requires using large amounts of energy (typically by combustion of hydrocarbon fuels) to generate the steam required for the stripper. In addition, at some plants it will be necessary to cool the bottoms from the steam stripper before they are sent to a downstream treatment process such as biological treatment. This will use additional energy. If steam stripping were compared to biological treatment as potential reference control technologies, biological treatment could be a more cost effective option for biodegradable VOHAPs.

The combustion of fuel to heat the steam, and the combustion of the condensed VOHAPs taken overhead from the stripper will result in the generation of nitrogen oxides and carbon dioxide. In a biological treatment system, only carbon dioxide is directly generated and only about 2/3 of the carbon in an organic compound is converted to carbon dioxide —— the remaining carbon is converted to biomass. Although the biological treatment system uses electrical energy, and thus results in secondary emissions of nitrogen oxides and carbon dioxide, on balance it does not typically represent the addition of new sources of combustion emissions since these units are already in use at most SOCMI plants.

EPA's cost estimates also do not include the costs of retrofitting a complete steam stripper installation into an existing chemical process. The design steam stripper and ancillary equipment require considerable space, which will often not be available within the battery limits of the process(s) that generate the wastewaters requiring treatment. In such cases, the steam stripper will have to be located at a remote location and extensive piping and construction will be required. Even when the steam stripper can be located in the battery limits of a process, it will be costly construct the stripper in the confined space and to repipe the sewer system of the existing process unit to separate those streams requiring stripping from those that do not. EPA has not included these retrofit costs in its steam stripper cost estimates, which could in some cases double the capital cost of the stripper installation.

EPA should reevaluate its RCT analysis to better address the true costs and benefits of the proposed steam stripping process. CMA believes that it will find, for many VOHAPs, that suppressed wastewater collection systems and biological treatment may be more cost-effective and environmentally appropriate than steam stripping.

e. EPA's Design Of The RCT Steam Stripper Should Include The Minimum Design Specifications Needed to Achieve The Performance Standard

As stated earlier in these comments, EPA has not placed in the public docket the EPA-modified ASPEN simulations that were used to estimate the strippabilities that the Agency assumes can be achieved by the RCT-design steam stripper. However, Appendix D of Volume 1B of the EIS does provide a description of the assumptions that EPA used to develop the RCT steam stripper characteristics that are specified at §63.138(f).

The EIS states that the following design assumptions were used: countercurrent sieve tray column; ten trays; tray spacing = 0.5 metre (m); tray efficiency = 80 per cent; total 2.5 m of inactive entrance and exit column; steam-to-wastewater feed ratio = 0.096 kg steam per litre of wastewater; and liquid loading of 39,900 litres per hour per square metre. Most of these assumptions have found there way into the RCT stripper design specifications at §63.138(f).

CMA has a number of problems with these design specifications, which must be followed if a facility wishes to take advantage of using the RCT and avoiding equivalency testing. As currently proposed, the RCT steam stripper will not achieve the strippabilities for all VOHAPs that EPA has estimated in Tables 9 and 33 and does not take advantage of current state-of-the-art steam stripper design practices to increase energy efficiency and cost effectiveness.

One problem is that the regulation indicates that the steam stripper must have a minimum of ten *theoretical* trays [§63.138(f)(2)], while the steam stripper efficiency calculations were apparently based on 10 physical trays (Appendix D, Volume 1B, EIS). This is further suggested by the fact that EPA specifies a minimum active column height of 5 m in the rule at §63.138(f)(1) and states that the tray spacing is 0.5 m in the EIS. However, based on an 80 per cent tray efficiency, CMA calculates that 13 physical trays are required for a steam stripper with ten theoretical stages. Therefore, there is a serious inconsistency in EPA's design assumptions with respect to the required number of trays in the RCT steam stripper.

EPA's assumption that a tray efficiency of 80 per cent is achievable for all regulated VOHAPs with its assumed RCT design is incorrect. The tray efficiency will vary as a function of the physical characteristics of each VOHAP. A tray efficiency of 80 per cent will simply be unachievable for any of the regulated VOHAPs. CMA's study will provide EPA with more realistic estimates of tray efficiency. Presumably, the proposed rule intends to allow use of packed columns as an alternate RCT design since it specifies a stripper with ten theoretical trays at §63.138(f)(2). However, the issue identified above with respect to whether or not the design steam stripper was based on ten physical trays or ten theoretical stages needs to be resolved, since this results in very different stripper designs.

A second problem with the RCT specifications for steam stripping is that EPA has over-specified the steam stripping operation. In the preamble at p. 62642 EPA states that:

> "The specifications for the steam stripper were developed to provide a standard piece of equipment (with the associated operating conditions) that can achieve greater than 95 per cent total HAP removal for most wastewater streams and greater than 99 per cent for streams containing primarily high volatility compounds."

The removal efficiency to be specified is under review by the Agency. All that is needed in the way of specifications for steam stripping RCT is a statement of the target VOHAP removal and the minimum number of equilibrium stages in the stripper. The individual operator can then use a process simulation package to establish the design and operating parameters needed to meet the performance objective.

The other specifications EPA has proposed will vary depending on site-specific design and operating considerations. The steam to feed ratio will vary depending on the chemicals, their concentrations, and the operating pressure of the tower, as is shown in the study as shown in Appendix M (Letter from B.Davis to J. Meyers, April 1, 1993). The liquid loading will depend on the column internal design. The limitation on water cooling is unneeded and unnecessarily limits the choice of cooling media. The specification of a condenser outlet temperature is not necessary, particularly in view of the fact that any vapors vented from the process are required to have downstream treatment.

All that is needed for the RCT steam stripper is a pure performance standard. The design and operating details necessary to comply with this standard can be left to case-by-case determinations based on site-specific process simulation modeling studies. The minimum specifications needed from the EPA to achieve the objectives of the performance standard are the minimum number of equilibrium stages and the VOHAP removal target.

These basic design issues must be resolved before EPA adopts a regulation stipulating steam stripper specifications. As the proposed regulation currently stands, EPA's steam stripper specifications are inconsistent with its strippability estimates.

f. The Regulation Should Allow A Facility To Demonstrate With A Simulation Technique, Such As ASPEN, That An Alternate Steam Stripper Design Is Equivalent To The RCT Stripper

As stated in the proposed rule, the specifications and efficiency of the RCT steam stripper have been estimated with EPA-modified ASPEN. In order for a facility to install a steam stripper that doesn't conform with EPA's design specifications at section 63.138(f), it would have to perform an equivalency analysis including collection and evaluation of inlet and outlet samples on a continuing basis. CMA believes that this requirement is unnecessary and inappropriate.

The rule should specifically allow a facility to use ASPEN simulations of alternate steam stripper designs (for example, vacuum steam stripping, packed columns, baffle columns, sieve trays, valve trays, and bubble cap trays) to demonstrate equivalency with the RCT stripper. Since EPA has based its entire RCT design on EPA-modified ASPEN simulations, it is only appropriate that ASPEN or alternative simulation models (for example, HYSIM, PROSYM, and FLOWTRAN) should be acceptable for demonstrating that an alternate design for a specific wastewater will achieve the same strippabilities for target VOHAPs as the RCT design. In fact, this was found to be the case during round-robin testing of a number of simulation models (Appendix N).

To accomplish this, CMA proposes that the following language should be added to §63.138(f):

> "...or a stripper that can be demonstrated by a mathematical simulation model to be equivalent to the RCT steam stripper."

3. <u>EPA Should Adopt Biological Treatment As An Additional Reference Control Technology</u>

EPA has specified steam stripping as the reference wastewater control technology for all VOHAPs (as identified in section 63.131, Table 9) that are proposed to be regulated by the HON rule. This includes VOHAPs in EPA's proposed strippability group C, for which the Agency has proposed an overall target removal efficiency of 70 per cent, and strippability Group B, with a target removal efficiency of 95 per cent (Table 9).

Many of the chemicals in these groups can be degraded in biological treatment systems more efficiently than they can be steam-stripped. In addition, as shown in these comments, even many of the very volatile Group A compounds can be effectively biodegraded in typical SOCMI wastewater treatment systems using enhanced biological treatment. Biological treatment, with wastewater transported in an emissions-suppressed collection system from the process source to the biological treatment units to prevent emissions during collection and treatment, should be established as a reference control technology for such VOHAPs. This is the same approach that the Agency has used for the benzene NESHAP for waste operations 40 CFR §61.264(b)(ii)(B).

CMA's recommended definition of an emissions-suppressed wastewater collection and treatment system (which is referred to as a suppressed collection system in these comments) consists of the following components:

1. individual drains fitted with s-traps or p-traps;
2. junction boxes with water seals;
3. junction boxes that are flooded to eliminate splashing from inlets;
4. covered drop boxes and lift stations where splashing may occur; and
5. covered treatment and storage tanks.

Figure 3 through 8 shows example drawings of these collection system control methods. In addition figures 9, 10, 11, and 12 are further explained in Appendix O.

A suppressed collection system consisting of these components will decrease VOHAP emissions from wastewater to low levels, based upon data from extensive pilot tests conducted for CMA by Enviromega (1993, *Measurement of Hazardous Air Pollutant Emissions from Drop Structures and Process Drains*, Burlington, Ontario) (Appendix P). These pilot tests demonstrate that emissions are primarily influenced by collection system component ventilation rates.

a. EPA's Emission Factors For Wastewater Collection And Treatment Systems Overestimate Air Emissions From Biological Treatment; Nonetheless, They Demonstrate That Biological Treatment Is A More Appropriate RCT Than Steam Stripping For Group B And Group C VOHAPs.

CMA has used EPA's WATER7 model, and the biological treatment unit design specifications that EPA used to develop the emission factors in the BACT/LAER BID, to calculate the destruction by biodegradation, and the estimated emissions, for

FIGURE 3

SUPPRESSED WASTEWATER COLLECTION SYSTEM

INDIVIDUAL DRAIN FITTED WITH S-TRAP

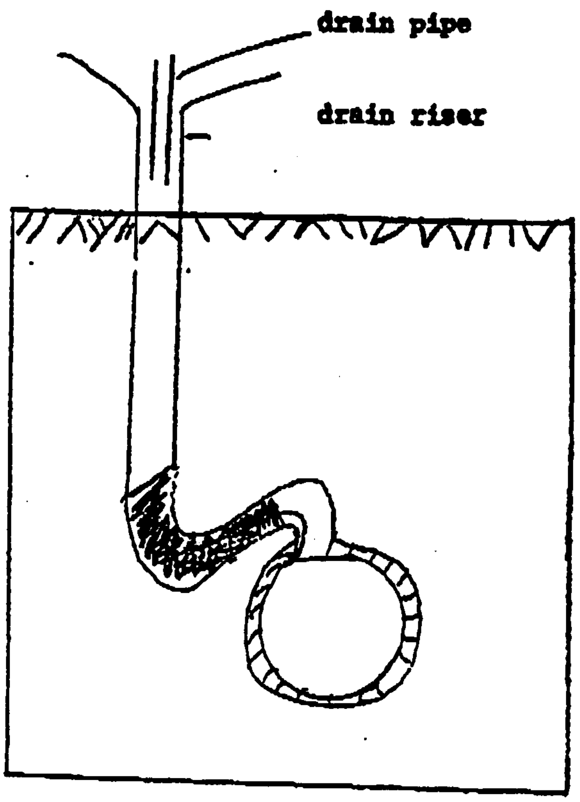


FIGURE 4

SUPPRESSED WASTEWATER COLLECTION SYSTEM

COVERED DROP BOXES WHERE SPLASHING MAY OCCUR.

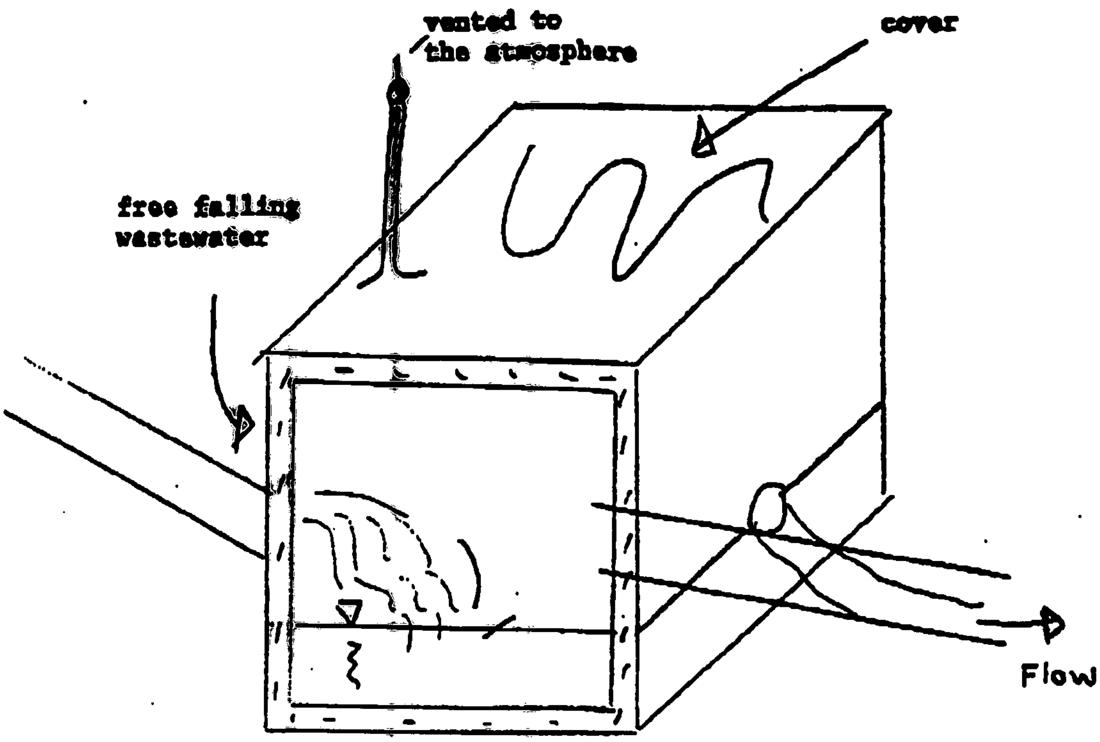


FIGURE 5

SUPPRESSED WASTEWATER COLLECTION SYSTEM

JUNCTION BOX WITH WATER SEALS

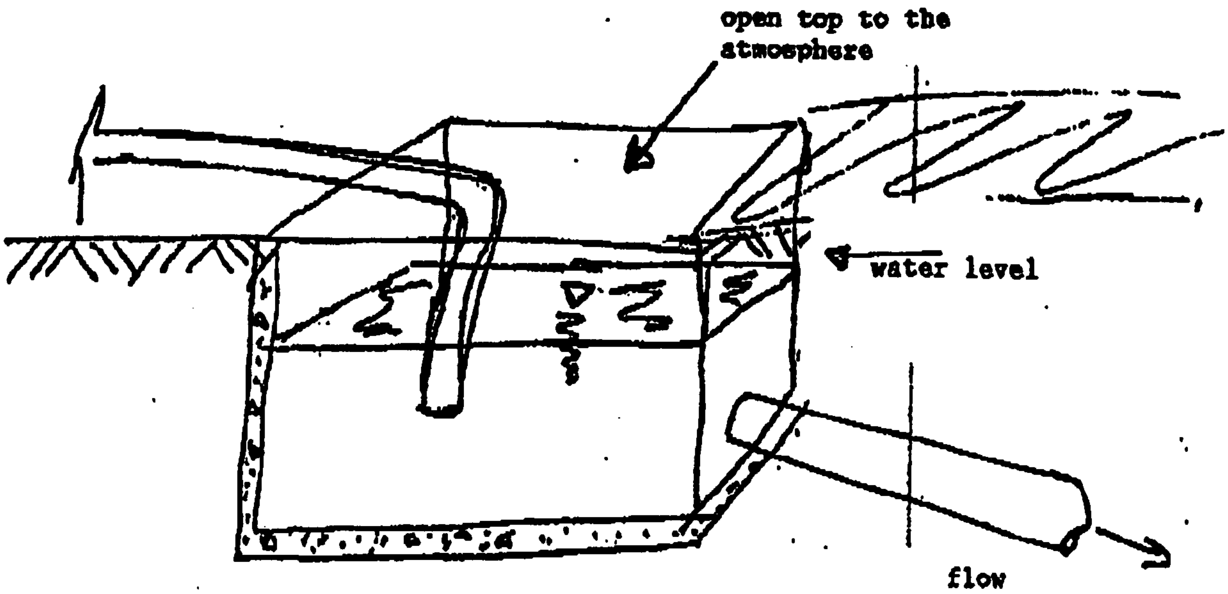


FIGURE 6

SUPPRESSED WASTEWATER COLLECTION SYSTEM

JUNCTION BOX WITH WEIR & WATER SEAL

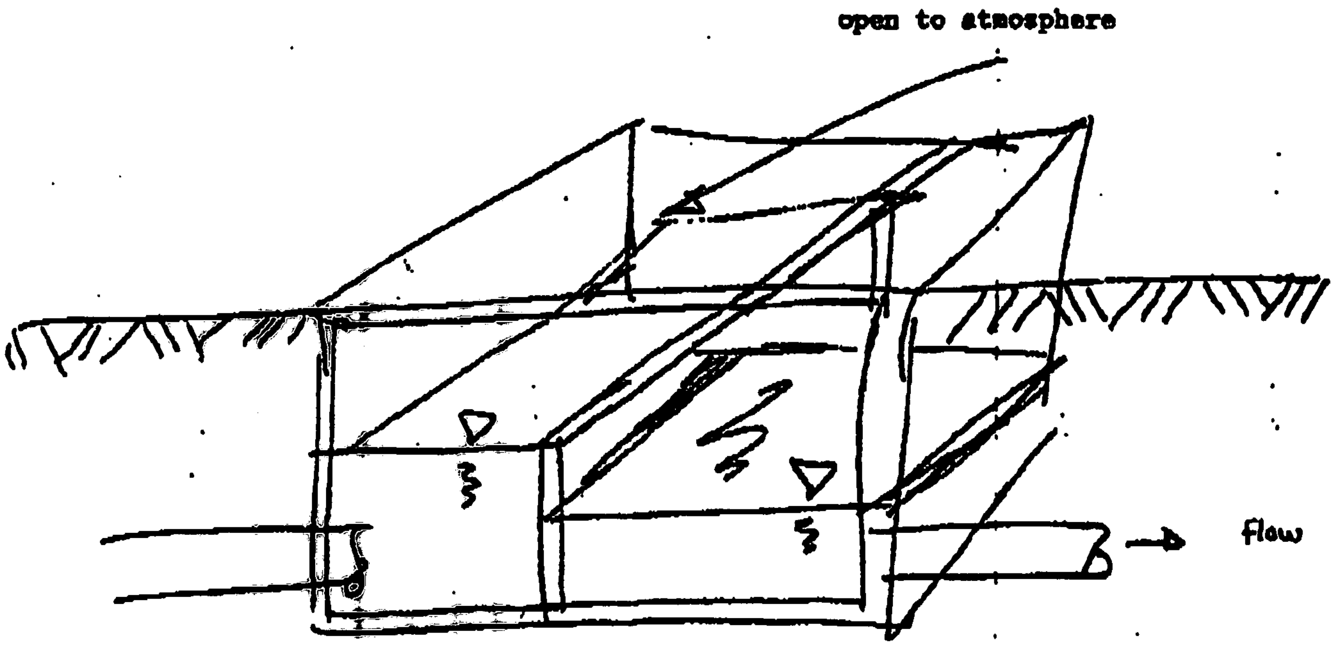


FIGURE 7

SUPPRESSED WASTEWATER COLLECTION SYSTEMS

JUNCTION BOX WITH CHANGING WATER LEVEL

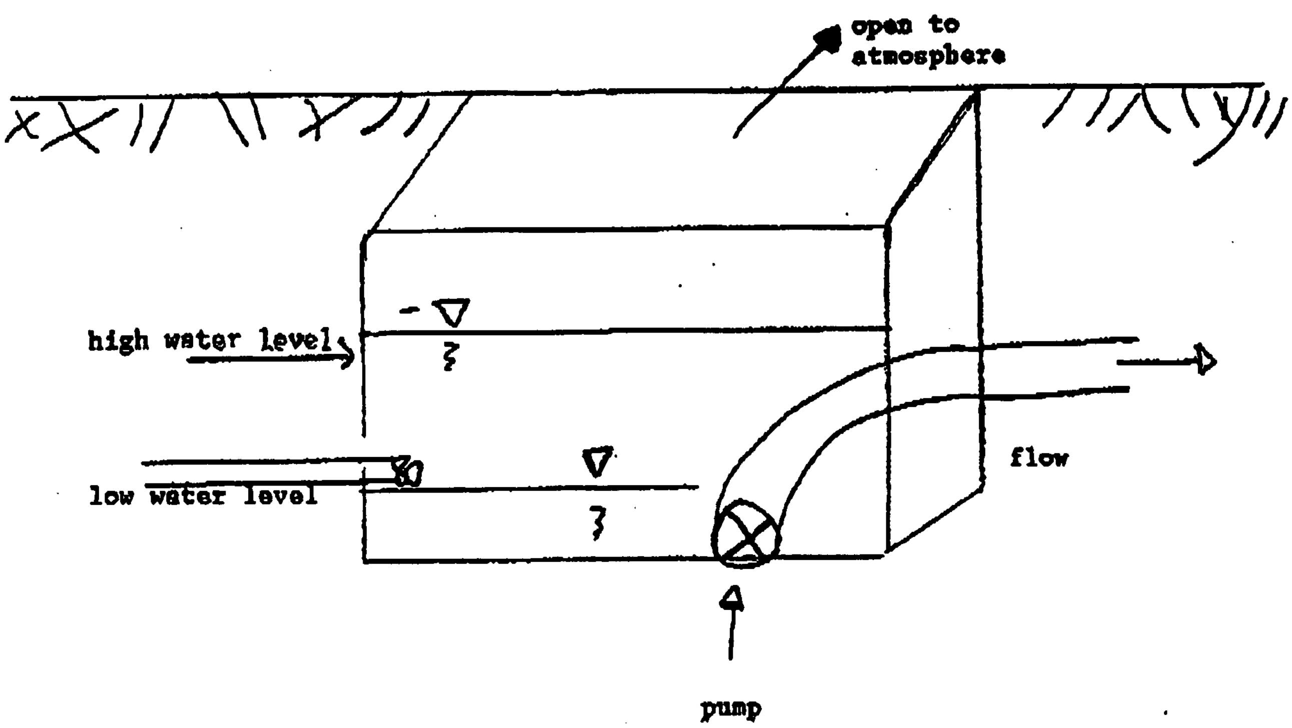


FIGURE 8

SUPPRESSED WASTEWATER COLLECTION SYSTEM

COVERED STORAGE TANK

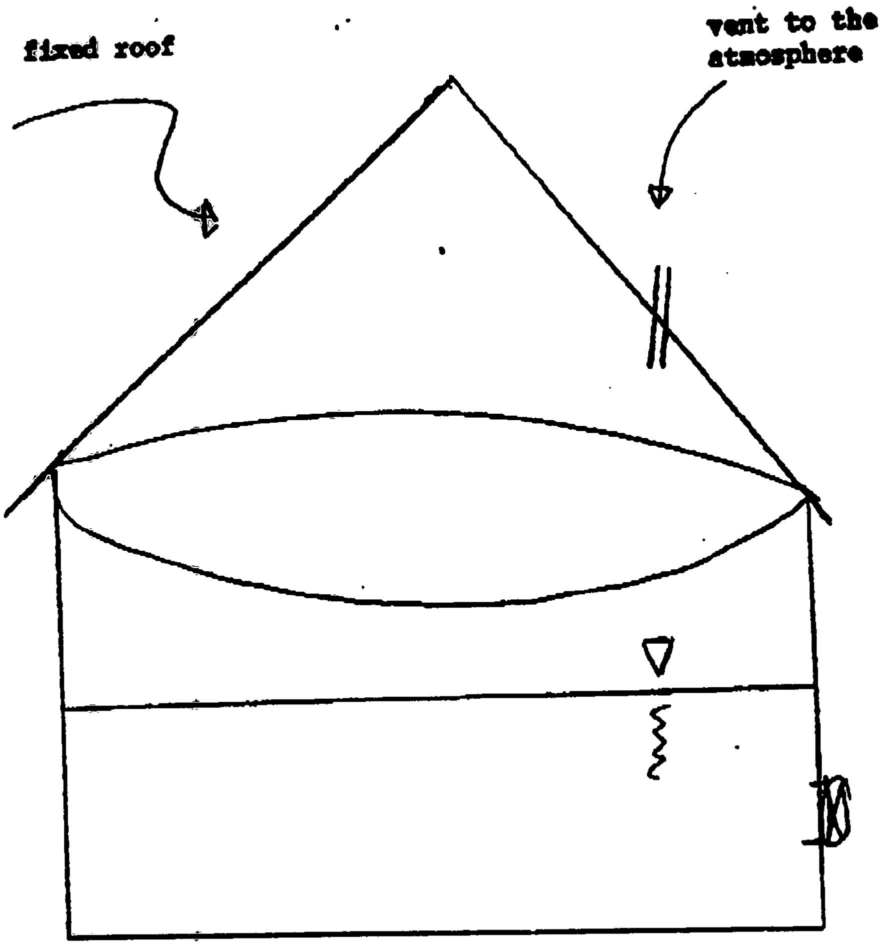


FIGURE 9

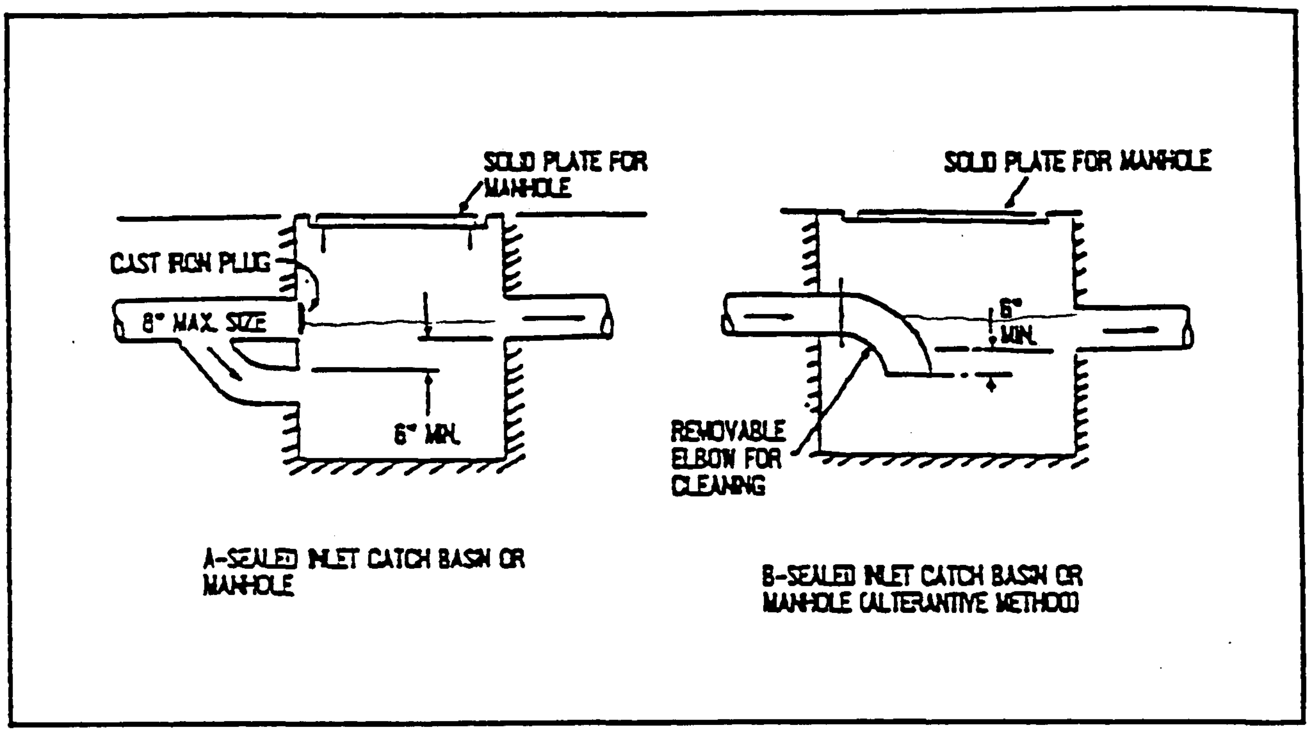

SOLID PLATE FOR MANHOLE
CAST IRON PLUG
8" MAX. SIZE
6" MIN.
A-SEALED INLET CATCH BASIN OR MANHOLE
SOLID PLATE FOR MANHOLE
6" MIN.
REMOVABLE ELBOW FOR CLEANING
B-SEALED INLET CATCH BASIN OR MANHOLE (ALTERANTIVE METHOD)

FIGURE 10

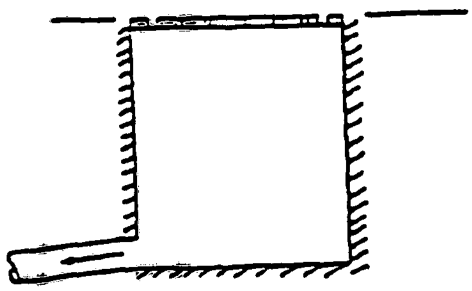
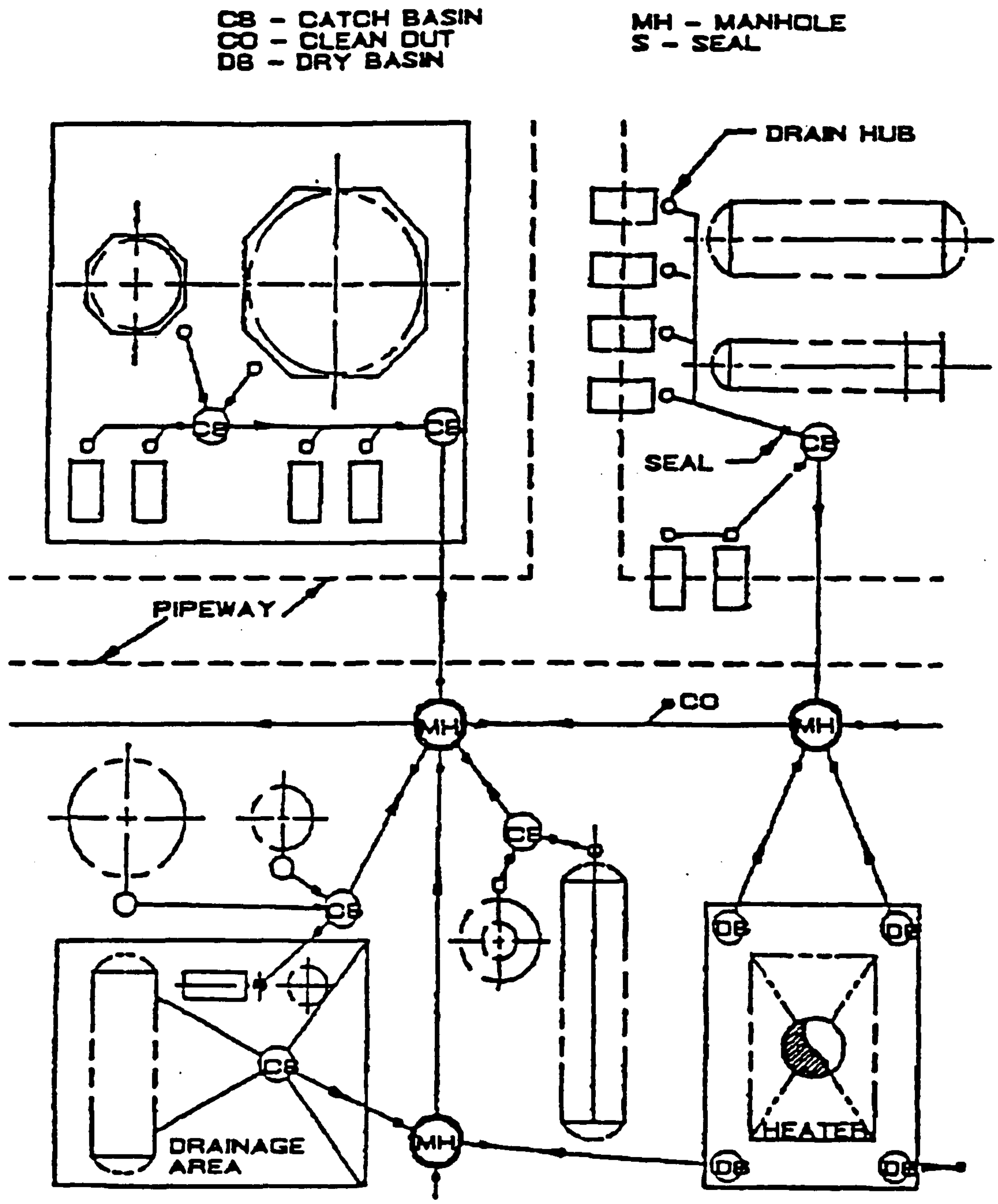
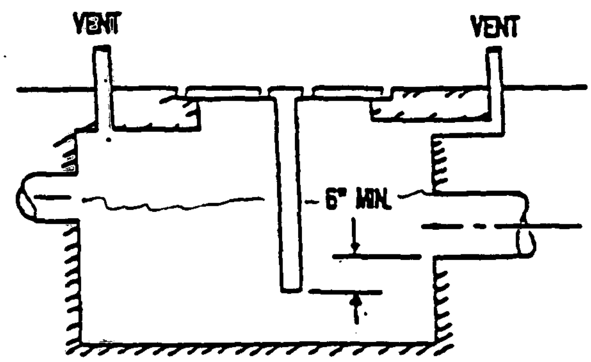


FIGURE 11



TYPICAL EQUIPMENT AND SLAB DRAINAGE ARRANGEMENT

FIGURE 12



SEALED VENTED MANHOLE
(FOR USE WITH CONCRETE AND
VITRIFIED CLAY PIPE, 15 INCHES
AND LARGER, AND FOR LARGER
MULTIPLE INLETS.)

Group C VOHAPs with kinetics coefficients in the WATER7 model and which CMA believes are biodegradable. The emission factors from the BACT/LAER BID are calculated using the same model as those presented in Table 9 of the proposed rule. Table 5 compares the destruction of these Group C chemicals achieved by biodegradation with their strippability as presented in Table 33 at p. 62759 of the proposed rule.

The calculated biological removal efficiencies for these VOHAPs are based on the kinetic rate coefficients in EPA's WATER7 model and EPA's assumed design characteristics for a biological treatment unit. Therefore, they are the same rates used to estimate the uncontrolled emissions presented in the proposed rule, absent the losses in the collection system and treatment units upstream of biological treatment. Moreover, these emission factors for biological treatment are substantially overestimated because EPA's biological treatment model is unrealistic compared to typical chemical industry design practice, as discussed later in these comments.

Even using these unrealistically conservative estimates of biodegradation, it is clear from this comparison that for the VOHAPs shown in Table 5, biological treatment is a more appropriate RCT than steam stripping. This demonstrates that EPA must reconsider the definition of the MACT for wastewater treatment systems, especially for the VOHAPs in strippability Groups B and C, which have low volatility and relatively poor steam stripping characteristics.

TABLE 5

WATER7 Estimates of Biodegradation and Volatilization Group C Compounds*

	Table 33** Fraction Steam-stripped	Biological Treatment Fraction Biograded	Fraction Emitted
methanol	0.829	0.9756	0.0162
aniline	0.468	0.9998	0.00108
o-cresol	0.448	0.9998	0.00013
1,1-dimethylhydrazine	0.448	0.9338	0.00051
dimethyl sulfate	0.697	0.9884	0.0023
3,3'-dimethylbenzidine	0.635	0.9997	0.000025
epichlorohydrin	0.89	0.8289	0.1608
ethylene glycol monomethyl ether acetate	0.529	0.9991	0.00053
o-toluidine	0.487	0.9962	0.0019
2,4-dinitrotoluene	0.626	0.9903	0.0075

b. The Wastewater MACT Should Include Biological Treatment With Suppressed Sewer Systems, And Biological Treatment Should Be Designated As An RCT Option For Biodegradable VOHAPs When A Suppressed Collection And Treatment System Is Used

As mentioned above, EPA's activated sludge model design is not a typical SOCMI design, and overestimates emissions from biological treatment because of its assumed physical characteristics. This is primarily because of two aspects of EPA's assumed design —— the basin has a very high surface area to depth ratio and an uncharacteristically long hydraulic retention time of 6.5 days. The depth of two metres and surface area of 17,652 square metres are unrealistic activated sludge system design parameters because of the difficulty of adequately mixing a basin of this configuration and the loss of heat during winter months that would occur. This shallow depth and long retention time are more typical of aerated lagoons which operate at low mixed liquor suspended solids (MLSS — the biological solids) and low power levels. EPA's design further assumes that the basin would be mixed and aerated with eight 75-horsepower surface aerators. This size aerator would never be specified for a 2 metre deep basin because its mixing pattern would interact with the bottom to such an extent that aeration and mixing would be severely compromised. The typical depth of activated sludge system aeration tanks that use mechanical surface aerators is 15 feet (4.6 metres) (Water Pollution Control Federation, 1988, *Aeration, A Wastewater Treatment Process*, Manual of Practice No. FD-13, Alexandria, Virginia). Submerged aeration systems for activated sludge aeration and mixing (diffusers, jet aerators) are not used in tanks with depths less than three metres (WPCF, 1988). The aeration tanks for submerged aeration systems are typically deeper than those used for surface aeration systems, and often are greater than six metres deep.

CMA has compiled data on the hydraulic retention time, depth, mixed liquor suspended solids concentration (MLSS), and aeration system type from the public docket and Development Document (EPA 440/1-87/009, October 1987) for the organic chemicals, plastics, and synthetic fibers (OCPSF) effluent limitations guidelines. Table 6 summarizes the activated sludge system aeration basin design data obtained from the public record. The median hydraulic retention time for these plants is about 1.6 days and the median MLSS concentration is approximately 3,500 mg/L. Only five of these 26 plants have hydraulic retention times greater than three days. The plant with the longest hydraulic retention time (plant 1293) treats coal tar manufacturing process wastewater and does not recycle sludge; it is operated more like an aerated lagoon than an activated sludge unit.

CMA revised the design characteristics of EPA's BACT/LAER activated sludge model to better represent typical industry practice. The characteristics of CMA's activated sludge model that are changed from the BACT/LAER BID model are as follows:

1. hydraulic retention time = 24 hours;
2. basin depth = 3.5 metres;
3. two 75-HP aerators (this is a higher power level per unit of aeration tank volume than used in EPA's model and will tend to increase emissions);
4. influent BOD_5 = 1,000 mg/L;
5. biological solids = 2,000 mg/L (this results in a relatively high organic loading of 0.5 kg BOD_5/kg MLSS-day);

TABLE 6
Activated Sludge Aeration Basic Designs
as Used at SOCMI Plants

Plant ID*	Flow (MGD)	Retention Time (days)	MLSS (mg/L)	Depth (ft)	Aeration System	Reference
P267	1.27	1.2			surface: 6-75 HP	EPA 12-Plant Study Report
2394	2.5	1.4	3056	11	surface: 6-75 HP	EPA 12-Plant Study Report
1494	3.84	0.57			submerged: diffused air	EPA 12-Plant Study Report
P6	1.21	1.65		12		EPA 12-Plant Study Report
1293	0.029	17.2				EPA 12-Plant Study Report
415	7.05	0.33				EPA 12-Plant Study Report
384	6.19	0.8	3250			EPA 12-Plant Study Report
725	1.59	0.48	1430	10		EPA 12-Plant Study Report
2631	1.5	2.3	3100			CMA 5-Plant Study Report
267	3.34	2.9	9400			CMA 5-Plant Study Report
948	17.4	3.4	2980			CMA 5-Plant Study Report
2481	0.92	1	5120			CMA 5-Plant Study Report
12	0.034	2.6				CMA 5-Plant Study Report
500	0.72	15	6250			OCPSF Development Doc., Table VIII-21
525	1.5	1	6000			OCPSF Development Doc., Table VIII-21
662	6.48	3	3081			OCPSF Development Doc., Table VIII-21
908	1.4	6	5000			OCPSF Development Doc., Table VIII-21
1343	0.374	2.8	3000 **			OCPSF Development Doc., Table VIII-21
1349	0.501	0.26	2800			OCPSF Development Doc., Table VIII-21
1609	1.5	1	5000			OCPSF Development Doc., Table VIII-21
1695	1.84	0.57	3000 **			OCPSF Development Doc., Table VIII-21
1766	0.432	3	3700 **			OCPSF Development Doc., Table VIII-21
2626	0.865	9	4000			OCPSF Development Doc., Table VIII-21
2631	9.4	1.5	5000			OCPSF Development Doc., Table VIII-21
2701	0.144	2	4200 **			OCPSF Development Doc., Table VIII-21
2536	3.6	1.2	2160			OCPSF Development Doc., Table VIII-21

*EPA Code Number from OCPSF record (P number is from the 12-plant reports)
**Estimated from MLVSS 2

6. temperature = 30 °C (this is greater than EPA's assumption of 25 °C and will tend to increase estimated emissions); and

7. the concentration of the VOHAP in the influent is assumed to be 500 mg/L, the same as the concentration used in the BACT/LAER BID steam stripping model (this assumption substantially overestimates actual influent concentrations, which would be diluted by wastewater streams with no or small amounts of HAPs. This assumption will tend to increase the estimated emissions). Matrix effects on VOHAP removal (i.e., the effect of other substrates on the biodegradation and volatilization of the target VOHAP) were not included in this analysis.

The remainder of the assumptions in CMA's activated sludge model (e.g., flow rate, aerator characteristics) are the same as EPA's BACT/LAER BID model. CMA has used the VOHAP-specific biodegradation kinetics coefficient data in EPA's WATER7 model to calculate the efficiency of biological treatment. However, CMA's assumption does not constitute agreement with the all of the biodegradation kinetics data used in the EPA model. CMA has concerns that the biodegradation kinetics data for some VOHAPs may not be reliable, and will be reviewing available biodegradation data to update the WATER7 kinetics data as necessary.

Using these assumptions, CMA has calculated the efficiency of biological treatment for all of the Group A, B, and C VOHAPs for which there are data in the WATER7 model data base and which CMA believes are biodegradable in enhanced biological treatment systems. The resulting treatment efficiency estimates are shown in Table 7.

The biodegradation efficiency for each VOHAP was estimated separately (as though it was the only VOHAP present). This was done because of the high VOHAP concentration assumed in the influent wastewater. If a mixture of VOHAPs was assumed to be present in the wastewater, the individual VOHAPs would be at lower concentrations or the overall organic loading would have to be increased proportionately (for example, if a total of 2000 mg/L of VOHAPs were assumed to be

TABLE 7

WATER7 Estimates of Biodegradation and Volatilization
Group A Compounds*

Compound	Table 33** Fraction Steam-stripped	Biological Treatment Fraction Biodegraded	Biological Treatment Fraction Emitted
acetaldehyde	1.000	0.9986	0.0013
allyl chloride	1.000	0.9953	0.0047
benzene	1.000	0.9991	0.0009
benzyl chloride	1.000	0.9994	0.0006
biphenyl	1.000	0.9998	0.0002
carbon disulfide	1.000	0.9984	0.0015
chlorobenzene	1.000	0.9999	0.0001
chloroform	1.000	0.9984	0.0016
chloroprene	1.000	0.9936	0.0063
cumene	1.000	0.9996	0.0004
1,3-dichloropropene	1.000	0.9985	0.0014
ethylbenzene	1.000	0.9994	0.0005
ethyl chloride (chloroethane)	1.000	0.9968	0.0031
1,1-dichloroethane	1.000	0.9994	0.0006
hexachloroethane	1.000	0.9997	0.0003
hexane	1.000	0.9991	0.0008
methyl chloride	1.000	0.9985	0.0015
methyl chloroform	1.000	0.9982	0.0017
methyl ethyl ketone	1.000	0.9994	0.0005
methyl isobutyl ketone	1.000	0.9997	0.0002
methylene chloride	1.000	0.9967	0.0032
naphthalene	1.000	0.9994	0.00056
2-nitropropane	1.000	0.9989	0.001
1,2-dichloropropane	1.000	0.9992	0.0008
phosgene	1.000	0.9987	0.0012
propylene oxide	1.000	0.9937	0.0062
styrene	1.000	0.9904	0.0094
toluene	1.000	0.9995	0.0005
triethylamine	1.000	0.999	0.001
2,2,4-trimethylpentane	1.000	0.9996	0.0004
vinyl acetate	1.000	0.9975	0.0024
m-xylene	1.000	0.9995	0.0005
o-xylene	1.000	0.9993	0.0007
p-xylene	1.000	0.9994	0.0006

*Based on enhanced biological treatment design (see text)
** Note: EPA shows 100% removal in Table 33, but actual steam stripping efficiency will be substantially lower (see text).

TABLE 7 (continued)

WATER7 Estimates of Biodegradation and Volatilization
Group B Compounds*

Compound	Table 33** Fraction Steam-stripped	Biological Treatment Fraction Biodegraded	Biological Treatment Fraction Emitted
acetonitrile	0.934	0.9996	0.0002
acetophenone	.92	0.9999	0.0001
acrolein	0.957	0.9995	0.0004
acrylonitrile	0.96	0.9997	0.0003
dichloroethyl ether	0.935	0.9992	0.0007
2,4-dinitrophenol	0.908	1.000	0.000
ethyl acrylate	0.961	0.9989	0.001
ethylene glycol dimethyl ether	0.943	1.000	0.000
isophorone	0.945	0.9999	0.00002
methyl methacrylate	0.958	1.000	0.000
nitrobenzene	0.936	1.000	0.000
2,4,5-trichlorophenol	0.914	0.9993	0.0007

*Based on enhanced biological treatment design (see text)

WATER7 Estimates of Biodegradation and Volatilization
Group C Compounds*

Compound	Table 33** Fraction Steam-stripped	Biological Treatment Fraction Biodegraded	Biological Treatment Fraction Emitted
methanol	0.829	0.9998	0.000047
aniline	.468	1.000	0.000
o-cresol	0.448	1.000	0.000
1,1-dimethylhydrazine	0.448	0.9986	0.0013
dimethyl sulfate	0.697	0.9999	0.000007
3,3'-dimethylbenzidine	0.635	1.000	0.000
epichlorohydrin	0.89	0.9993	0.0006
ethylene glycol monomethyl ether acetate	0.529	1.000	0.000
o-toluidine	0.487	1.000	0.000
2,4-dinitrotoluene	0.626	1.000	0.000

*Based on enhanced biological treatment design (see text) present, the wastewater biochemical oxygen demand loading would be 5000 mg/L or greater). If the organic loading is increased, both the MLSS and hydraulic retention time would have to be increased to achieve the same organic loading. This would have resulted in unrealistic design assumptions as compared to the typical SOCMI plant, most of which typically treat wastewater with an influent BOD concentration of 2000 mg/L or less (OCPSF Development Document, Table V-28).

As can be seen from these estimates, EPA's WATER7 model predicts that biological treatment will provide greater than 99 per cent removal for every Group A, B, and C VOHAP evaluated under these design conditions. The estimated fractions emitted to the air are negligible. These estimates are made with EPA's WATER7 emissions model, which it used to develop the emission estimates for the proposed rule. Therefore, these estimates are as reliable as EPA's estimates of the fraction of VOHAPs emitted from wastewater collection and treatment systems used to justify the proposed rule.

Two figures have been prepared to demonstrate an approach for identifying those VOHAPs for which RCT should be biological treatment. Figure 13 shows the effect of Henry's Law constant on volatilization from a biological treatment unit in the absence of biodegradation, and Figure 14 illustrates the percent removal of selected VOHAPs by biodegradation as a function of each VOHAP's Henry's Law constant and relative biodegradability. The biodegradation efficiencies were estimated using CHEMDAT7 with the activated sludge treatment unit specifications described above. For some of the VOHAPs, the default biodegradation coefficients have been replaced with more reliable coefficients developed by a member company.

Figure 13 demonstrates that VOHAPs with Henry's law constants below 10^{-4} atm-m^3/mol will not volatilize from biological treatment aeration basins, even in the absence of biodegradation. Biological treatment is clearly RCT for such VOHAPs, since there is essentially no potential to emit them from the treatment unit.

Biological treatment should be identified as RCT for a specific VOHAP based on that chemical's biodegradation rate and Henry's Law constant. Figure 14 depicts how these two characteristics of a specific VOHAP should be applied for selection of the appropriate RCT.

The figure makes it simple to identify chemicals that are most effectively removed from wastewater by biodegradation. All VOHAPs in the unshaded area of the figure should have biological treatment specified as RCT. The shaded area on the figure indicates those chemicals that would not have biological treatment identified as RCT -- steam stripping would be RCT for these VOHAPs. Biological treatment could be applied to treat wastewaters containing chemicals in the shaded area of the figure provided an RCT equivalency demonstration, as required by proposed §63.138, has been successfully performed by the facility.

CMA's analysis demonstrates that biological treatment should be defined as RCT for biodegradable VOHAPs when a suppressed collection and treatment system is used to transport the wastewater from the point of generation to the biological treatment unit. The suppressed collection system should achieve the same suppression of emissions as specified in the benzene NESHAP rule for individual drain systems (40 CFR 61.346). Suppressed collection systems and enhanced biological treatment should be specified as MACT, and the

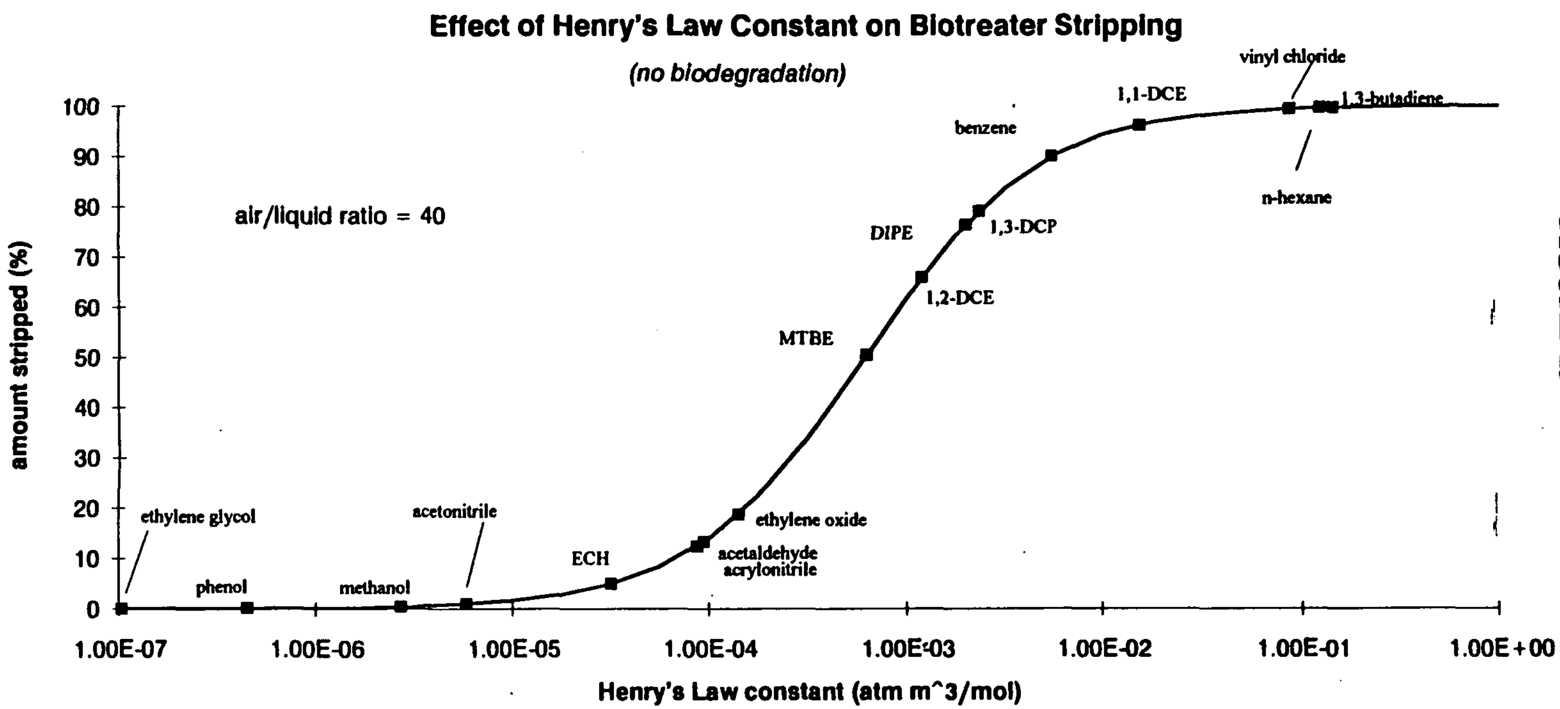

Effect of Henry's Law Constant on Biotreater Stripping
(no biodegradation)
air/liquid ratio = 40
amount stripped (%)
Henry's Law constant (atm m^3/mol)
0
10
20
30
40
50
60
70
80
90
100
1.00E-07
1.00E-06
1.00E-05
1.00E-04
1.00E-03
1.00E-02
1.00E-01
1.00E+00
ethylene glycol
phenol
methanol
acetonitrile
ECH
acetaldehyde
acrylonitrile
ethylene oxide
MTBE
1,2-DCE
DIPE
1,3-DCP
benzene
1,1-DCE
vinyl chloride
1,3-butadiene
n-hexane

FIGURE 13

Example of How a Nomograph of the Effect of k1 and H on Fraction of VOHAP Biodegraded Could be Constucted to Select Biotreatment as Reference Control Technology

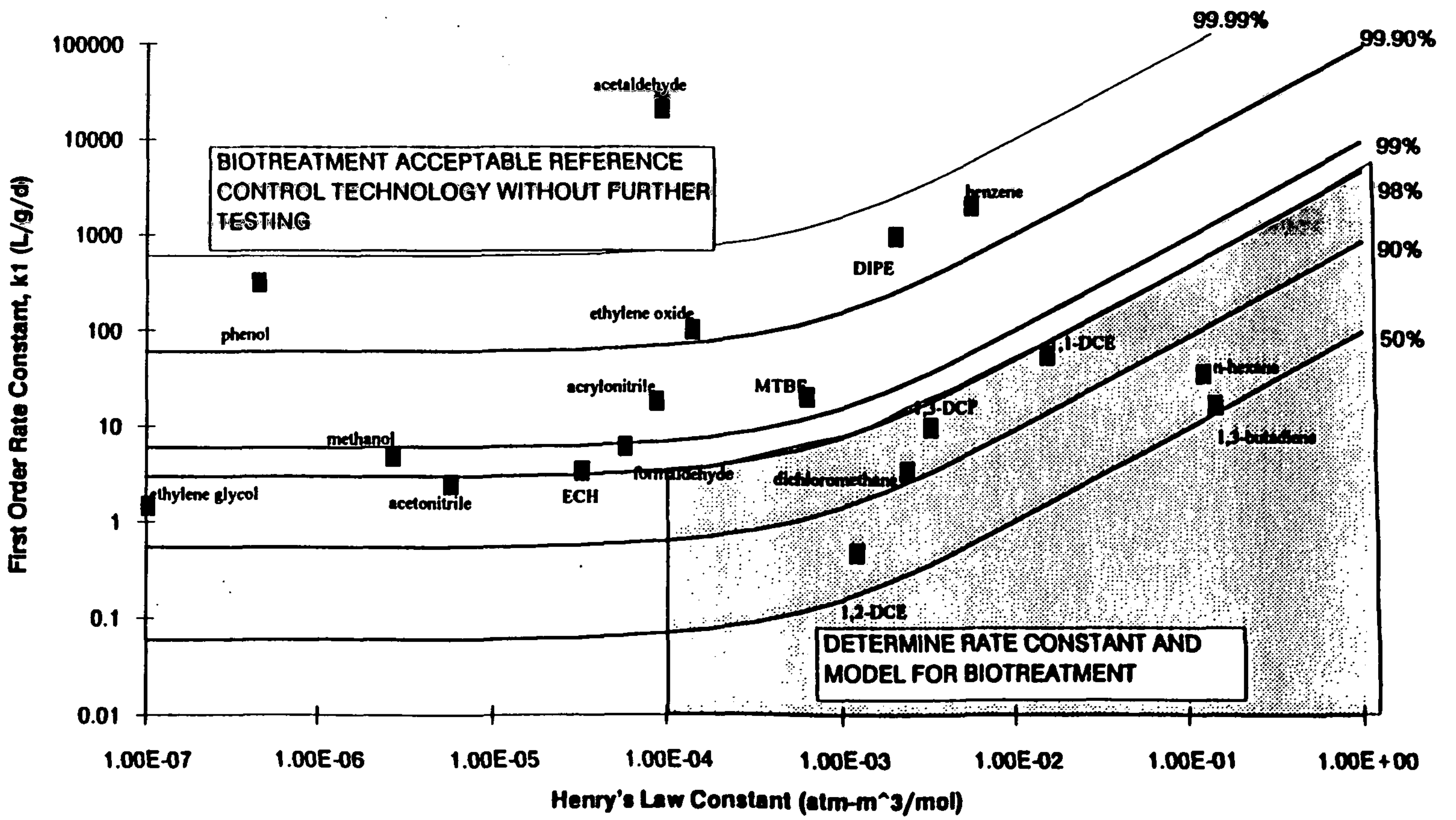


FIGURE 14

incremental cost-effectiveness of any additional treatment such as steam stripping should be measured from this baseline.

c. Biological Treatment Has Advantages As An RCT Option, Since It Will Provide Treatment For Organic HAPs In Many Wastewater Streams That Are Not Regulated By The Proposed Rule

Biological treatment will effectively treat organic HAPs that cannot be treated by steam stripping, such as phenol and methanol. Although these HAPs have a small potential to emit from wastewater collection and treatment systems, they do represent some fraction of organic HAP emissions that are not controlled by the proposed rule but can be very effectively destroyed by biological treatment.

In addition, Group 2 wastewaters that do not require treatment under the HON regulations will be effectively treated in biological treatment systems that are designed to treat wastewaters for the entire SOCMI plant. Also, in plants that have both SOCMI processes regulated by the HON rule and non-SOCMI processes that are unregulated but generate wastewaters containing VOHAPs, centralized biological treatment will provide effective treatment of VOHAPs in the non-SOCMI wastewater as well as in the SOCMI wastewater.

The use of centralized enhanced biological treatment units as an RCT offers the opportunity to extend the VOHAP controls targeted by the wastewater HON to VOHAPs in wastewaters that either are exempt from control (Group 2 wastewaters, VOHAPs that cannot be effectively steam stripped) or are present in wastewaters from non-SOCMI manufacturing processes. This is an advantage that would not be realized if the only available RCT is steam stripping.

d. Simulation Models Should Be An Acceptable Method For Demonstrating That An Enhanced Biological Treatment System Complies With The HON

EPA has used simulation modeling to establish the design and operating provisions for the RCT steam stripper and WATER7 to estimate emissions from wastewater treatment units, including biological treatment units. CMA believes that the regulation should allow facilities to use the WATER7 model, or equivalent models such as PAVE, TOXCHEM, BASTE, and CINCI, with site-specific data to demonstrate that a biological treatment unit that differs from the RCT design complies with the HON. Since the bases for RCT design and operating specifications are model simulations, there is no reason why the models cannot be used to evaluate the performance of RCT-type treatment processes with different design and operating criteria.

CMA recommends that a provision be added to the HON to allow the use of approved simulation models to demonstrate that an alternate biological treatment system design or operating conditions can achieve the target VOHAP destruction rate. A facility that used the simulation approach would be required to have full documentation of the simulation results, equivalent to the design analysis requirements of §63.139(c)(2).

e. EPA's Mathematical Formulation For Biological Degradation In The WATER7 Model, And The Similar Calculations In Other Acceptable Simulation Models, Correctly Assumes That Sorption Is Not A Significant Removal Pathway For VOHAPs

EPA's WATER7 model, which uses the Monod kinetics model to simulate biodegradation kinetics, assumes that sorption of VOHAPs to the biological solids is a negligible removal pathway and therefore excludes this pathway from the calculations. Only biodegradation and volatilization are assumed to affect the removal of VOHAPs from the